4.0 Institutional Review

The institutions that have established the existing system of Puget Sound marine protected areas, and that have the authority, ability or potential to provide designation mechanisms for new MPAs, are numerous and varied. A complex mix of government agencies, institutions and private sector organizations are involved with MPAs.

Multiple-program or cross-agency sources of information about protected area designations and mechanisms in Puget Sound are essentially non-existent. Therefore, to gain an understanding of the existing set of MPAs and supporting institutional mechanisms, review and analysis are required on an agency-by-agency, institution-by-institution, and program-by-program basis.

This review represents a necessary early step toward strategic development of a marine protected area system, which is of interest to many in the region and a primary tenant of the Washington MPA Work Group. An institutional understanding of MPA designation mechanisms and management approaches allows for consideration of the full diversity of available protection options, and may bring to light potential cooperative and partnership opportunities within and between agencies and organizations.

This section reviews existing institutions and designation mechanisms responsible for the establishment and management of the current system of Puget Sound marine protected areas. Included in this broad review are discussions of various policies, goals, objectives, programs and laws related to the existing, Potential/Possible and Proposed MPAs identified at Section 3.2 (see also Appendix B).

Primary institutional focus is placed on state and federal agency roles in MPA establishment and management. Additional discussions are provided concerning the involvement and efforts of Treaty Tribes, local governments, and various private sector organizations.

4.1 Washington State Agencies and Institutions

Several state government institutions play an important role in the establishment and management of protected areas within the marine environment of Puget Sound. This section discusses four state agencies and one state institution that are directly involved in the designation and management of intertidal and subtidal protected area sites. The state agencies and institutions reviewed in Section 4.1 are:

- 4.1.1 Washington State Department of Natural Resources (DNR)
- 4.1.2 Washington State Department of Fish and Wildlife (WDFW)
- 4.1.3 Washington State Parks and Recreation Commission (WSP&RC)
- 4.1.4 Washington State Department of Ecology (Ecology)
- 4.1.5 University of Washington's Friday Harbor Laboratories (FHL)

The primary focus of this review is on the state agencies directly responsible for the designation and management of existing marine protected areas. Additional agencies could be added to this list, such as the Puget Sound Water Quality Action Team (PSWQAT), the Department of Community, Trade and Economic Development (DCTED) and the Interagency Committee for Outdoor Recreation (IAC). While these and other state institutions serve important functions related to marine area management and resource protection, such as contributions to inter-agency planning processes, local land use planning and funding assistance, the emphasis here is on those agencies designating and managing protected areas.

Each of the state institutions bulleted above are characterized by the role of the agency in protecting marine areas of Puget Sound. Programs and laws that establish authority, capability and potential for MPA designation are briefly reviewed. Each state agency's site-level contribution to the existing system of MPAs is discussed, including brief discussions on established sites.

4.1.1 Washington Department of Natural Resources

The Washington State Department of Natural Resources (DNR) acts as manager and trustee for over 5 million acres of state-owned public lands. The aquatic portion of these public lands includes two million acres of tidally influenced lands, such as tidelands and marine bedlands, as well as the beds and shores of freshwater bodies (DNR 1992a). As such, DNR is closely involved in the designation of many existing and potential marine protected areas, and plays a prominent and broad state role in MPA establishment. The reason for this important role is in part because of DNR's responsibility as a steward of public aquatic lands. Additionally, DNR's responsibility for state lands (terrestrial and aquatic) requires all other agencies to obtain the cooperation and approval of DNR whenever the establishment of a marine protected area involves the withdrawal of public aquatic lands.

This section will first discuss first DNR's broad responsibility for the management of public aquatic lands, linking the agency's resource management authority, lease management decisions and tideland and bedland withdrawals to the establishment of MPAs. Specific protected area programs administered by DNR are then discussed in light of their contribution to MPAs. These programs include the Natural Heritage Program and the Natural Resources Conservation Area Program.

Aquatic Lands Management

In managing aquatic lands, DNR is guided by public trust values articulated in the State Constitution, state statutes, and case law. This guidance directs DNR to manage public aquatic lands as a public resource for the benefit of current and future citizens of the State of Washington (DNR 1992a). These values are represented by the following aquatic lands management goals (WAC 332-30-100):

a) Foster water-dependent uses;
b) Ensure environmental protection;
c) Encourage direct public use and access;
d) Promote production on a continuing basis of renewable resources;
e) Allow suitable state aquatic lands to be used for mineral and material production;
f) Generate income from use of aquatic lands in a manner consistent with the above goals.

One of the primary ways that DNR carries out these goals is by authorizing and placing limits on the use of public aquatic lands among competing demands. In carrying out this management responsibility, the DNR strives to provide a balance of public benefits for all citizens of the state (DNR 1992a; Condello, unpublished 1996).

The vast expanse of intertidal and marine area managed by DNR, through the Aquatic Lands Division, underscores this agency's importance in marine protected area establishment and development. In the marine environment, this management responsibility applies to some 3000 lineal miles (or 131,000 acres) of public tidelands state-wide (DNR 1992a), a majority of which can be found along the shores of Puget Sound and adjacent inland marine waters. Tidelands are defined as the area between the line of extreme low and mean high tide (DNR 1992a).

Since statehood in 1889, approximately 61% of state tidelands have been sold to private interests for commerce and development. This practice ended in the early 1970s, leaving the remaining tidelands under public-ownership and DNR management. The state's marine bedlands, however, have always been held in the public trust, and comprise approximately 53% (some 1.1 million acres) of all state-owned aquatic lands (DNR 1992).

Marine and freshwater aquatic plants on state-owned aquatic lands are the property of the state. In the marine environment, DNR manages all subtidal aquatic plant communities (kelp, seagrass, seaweeds) and those intertidal plant communities found on state lands. In these areas, DNR manages the harvest of seaweeds. Since 1988, DNR has imposed a moratorium on commercial harvest of all wild seaweeds (DNR 1992a).

In consideration of the establishment of no-take MPAs (where the removal of any and all marine life is prohibited), DNR's authority to manage and regulate harvest of marine plants is significant. DNR's authority is clear in this area, and broader than the permit- or property ownership-based abilities of other state agencies or institutions.

DNR also has management jurisdiction over aquatic animals affixed to or embedded in state-owned aquatic lands, such as oysters, clams, mussels, scallops, and shrimp (DNR 1992a). While DNR authorizes activities such as oyster and clam cultivation and manages geoduck harvesting tracts on state-owned aquatic lands, management of the fisheries for these and all other fished species is the jurisdiction of the Washington Department of Fish and Wildlife (Section 4.1.2).

DNR's aquatic lands management roles and responsibilities provide for a variety of marine conservation and protection mechanisms. However, when considering the role of DNR's aquatic lands management practices in establishing MPAs, it is important to remember that DNR has a mandate to treat such areas as public resources, and maintain in trust the public rights of fishing, navigation and commerce (DNR 1992a). While a thorough discussion of specific legal directives relating to DNR's role in managing aquatic lands and resources is beyond the scope and purpose of this report, a comprehensive discussion and analysis can be found in the recent work of Condello (unpublished 1996).

Aquatic Lands Leasing and Marine Protected Areas

Concerning the protection of marine resources from certain lease activities or uses, DNR's policy, as found in the statutes, states that DNR shall:

"consider the natural values of state-owned aquatic lands as wildlife habitat, natural area preserve, representative ecosystem, or spawning area prior to issuing any initial lease or authorizing any change in use. The department may withhold from leasing lands which it finds to have significant natural values, or may provide within any lease for the protection of such values" (RCW 79.90.460).

Thus, DNR is essentially directed to consider the value of public aquatic lands for protected areas.

Aquatic Lands (Marine) Reserves

According to statute, DNR shall consider for "reserve" status those aquatic lands of special educational or scientific interest or of special environmental importance threatened by degradation (WAC 332-30-151; RCW 79.68.060). By statute, the extent of DNR management in reserve areas is said to consist of a critical review of all lease applications at and adjacent to the site to insure that proposed activities or structures do not conflict with the basis for reserve designation (WAC 332-30-151; RCW 79.68.060). Management responsibility can also be assigned to another government agency or institution.

While such provisions seem to suggest the possibility of DNR-established intertidal or marine reserve areas that are protected from potentially damaging development or activities, this potential does not appear to have been realized. Research by Eng (unpublished 1993) and a draft report by Jamison (1993) suggest that there are 17 potential "marine reserves" of this nature identified in the state, but neither formal DNR designation nor active DNR management of these areas as reserves appears to have occurred. For these reasons, such DNR marine reserves are not included on the list of marine protected areas provided in this report, with one exception. Under this statute (RCW 79.68.060), a withdrawal of subtidal aquatic lands was made by DNR in a lease agreement with the U.S. Fish and Wildlife Service in 1988. Under this agreement, the subtidal area adjacent to Protection Island, extending 600 feet offshore, is said to "be a natural resource of great natural value that should be reserved" and "...shall be reserved and withdrawn from conflicting uses for an indefinite term" (DNR 1988). Refer to Section 4.2.2 for more information on the Protection Island National Wildlife Refuge.

Withdrawal of Aquatic Lands

Another means by which DNR can "reserve" aquatic lands is through the removal of such lands from commercial leasable status. To the extent that this practice can result in aquatic land areas that are protected from potential commercial use activities and impacts which would conflict with the objectives of established protected areas, this is a fundamental tool to support MPAs.

Examples of this kind of aquatic land withdrawal can be found at intertidal areas adjacent to several San Juan Island area Preserves established by The Nature Conservancy (see Section 4.5). DNR withdrawal of public tidelands has also occurred at other MPAs identified in this study, including the Tongue Point Marine Life Sanctuary (Section 4.4), Edmonds Underwater Park (Section 4.5), Titlow Beach Marine Preserve (Section 4.5), and others.

While these aquatic land management policies and practices are broadly applicable to MPA establishment, DNR's most direct involvement in the actual designation and management of existing MPAs comes from administration of the Natural Heritage Program and the Natural Resources Conservation Area Program. These programs are discussed next.

Natural Heritage Program and Natural Area System

In 1972, the Natural Area Preserves Act established the Natural Heritage Program and the Natural Area System, both of which are administered by the Department of Natural Resources. The Natural Heritage Program was established by the state legislature for the purpose of identifying and preserving outstanding natural areas through a statewide inventory of natural communities, species and features (DNR 1995). Chapter 79.70 of the Revised Code of Washington, The Natural Area Preserves Act, expresses the philosophy of the Natural Area System and the Natural Heritage Program as follows:

"All areas within the state, except those which are expressly dedicated by law for preservation and protection in their natural condition, are subject to alteration by human activity. Natural lands, together with the plants and animals living thereon in natural ecological systems, are valuable for the purposes of scientific research, teaching, as habitats of rare and vanishing species, as places of natural historic and natural interest and scenic beauty, and as living museums of the original heritage of the state.

It is, therefore, the public policy of the State of Washington to secure for the people of present and future generations the benefit of an enduring resource of natural areas by establishing a system of natural area preserves, and to provide for protection of these natural areas" (RCW 79.70.010).

The Natural Heritage Program classifies special species and natural communities of the state into "element" types, conducts ongoing inventories of element locations and ecological conditions, and stores this information in a data bank (DNR 1995). This is a cooperative process, involving state and federal agencies, private organizations and individuals. From this, elements are identified and prioritized based on rarity and threats, and site nominations are formed for the Natural Area System.

The Natural Area System is an assemblage of areas, both land and water based, recognized by the state (through the Natural Heritage Program) as being important for the preservation of natural heritage resources, and registered or designated as natural areas for the protection and perpetuation of these significant features (DNR 1995). A 14-member Natural Heritage Advisory Council advises DNR on the establishment and management of all private or public Natural Areas. The collection of Natural Areas make up the state's Register of Natural Area Preserves (the Register). A site can be added to the Register by one of three means: Registration, Dedication or

Acquisition (DNR 1995).

Registered Natural Areas

Registered Natural Areas are those private or public lands that are voluntarily protected by landowners. Once the Natural Heritage Program identifies a possible site for registration, the owner of the land is notified. Only with the landowner's wholly voluntary permission may the site may be registered. The property interest and rights to a Registered Natural Area remain with the landowner, as does management responsibility, unless other arrangements are made with DNR (DNR 1995). Written request by the landowner is all that is needed to remove a property from the Register (DNR 1995).

As of 1995, over 90 private, local and federal landowners have voluntarily agreed to protect natural resource values on their property through registration as a Natural Area (DNR 1995). Statistics are not available on the extent of private tidelands represented within this system, and site locations are not advertised. This first, and lowest, level of protection provided through the Natural Heritage Program offers some potential for establishment of voluntary tideland-based marine protected areas. However, due to lack of available details on these Registered Natural Areas, they have not been included on the marine protected areas listed in this study.

Dedicated Natural Areas

Dedicated Natural Areas, another voluntarily established type of protected area, offer a stronger level of protection for natural resources than Registered Natural Areas. With this approach, a private property owner may voluntarily transfer a legal property interest to the state, while retaining management, custody, use or rights and privileges (DNR 1995). Dedicated Natural Areas can also be established without the transfer of real property interests when a public agency, through a cooperative agreement with DNR, commits to provide management and administrative or legal measures directed at the protection of identified natural heritage elements on site (DNR 1995).

As with Registered Natural Areas, insufficient information is available on the extent of tidelands protected at these dedicated areas, especially pertaining to privately dedicated lands. As such, they are not included in the list of marine protected areas provided in this report.

Acquisition for Natural Area Preserves

By far the most protective level of Natural Area provided through the Natural Heritage Program comes about through DNR's acquisition and designation of sites as Natural Area Preserves. DNR acquires such land areas by purchase from willing sellers or by gift. DNR also works with private groups, such as The Nature Conservancy, which acquire lands for Natural Area Preserves from willing sellers and subsequently transfer them to DNR (DNR 1995).

The purpose of Natural Area Preserves are:

1) to protect examples of undisturbed terrestrial and aquatic ecosystems, rare plant and animal species and unique geologic features;
2) to serve as gene pool reserves;
3) to serve as baselines against which the influences of human activities in similar, disturbed ecosystems may be compared; and
4) to provide outdoor laboratories for scientific research and education (DNR 1995, B-4).

Natural Area Preserves (NAPs) offer a high level of protection in that they are, with few exceptions, closed to

public access to prevent direct human-caused ecosystem disturbances. NAPs have received the highest possible protection rankings offered by the Natural Heritage Program. An explanation of that ranking system follows.

Natural Heritage Program Land Management Designation Assessments

A 1995 Natural Heritage Plan provides an assessment of designation security and protection adequacy for 22 types of state and federal land management designation types found within Washington. Of these, only six designation types are linked to Puget Sound MPAs identified in this study[1] . The assessment of designation security refers to the relative degree of permanency associated with a particular designation, and consists of the following ratings: secure (management designation cannot be readily changed or removed; potentially secure; or insecure (DNR 1995, B-3). Protection adequacy is gauged by the ability of the designation type to assure the survival of various elements (those identified by the Natural Heritage Program as needing representation within the Natural Areas System) into the foreseeable future. Protection adequacy ratings are: adequate (all elements will typically be assured survival into the foreseeable future); potentially adequate; and not adequate (DNR 1995, B-3).

Under this evaluation scheme, Natural Area Preserves are considered to be secure in designation and adequate with respect to protection (DNR 1995). These rankings are the highest possible, with only two other designation types equaling it: federally designated Research Natural Areas and privately established Natural Area Preserves (such as those of The Nature Conservancy).
DNR currently manages approximately 23,000 acres at 45 Natural Area Preserves throughout the state (DNR 1997a).

Natural Area Preserves as MPAs

Of the 45 NAPs in Washington State, three sites include intertidal area within Puget Sound: Dabob Bay NAP in Kitsap County, Kennedy Creek NAP near Olympia in Mason and Thurston Counties and Skookum Inlet NAP near Olympia in Mason County. Because of their focus on ecosystem protection, these NAP sites are categorized in this study as Marine Habitat/Nature Preserves. A fourth NAP site is located on the shores of Puget Sound at Point Doughty on Orcas Island, but does not include intertidal area within its boundary (Powell, personal communication 1997). Some general observations about the intertidal NAPs as MPAs are noted here, and are listed in **Table 3**.

Although NAPs can offer a high level of site protection, those of Puget Sound are limited in marine focus. None of the NAP MPAs contain subtidal area. Furthermore, the Natural Heritage Plan priority elements that are listed at these three sites consist primarily of marsh plant communities, upland forest communities and coastal spit vegetation; little or no marine community elements are identified for these areas (DNR 1995). However, tidal marsh areas and unvegetated tidal flats, and the marine resources associated with them, do receive protection by way of the public access restrictions at NAPs.

Table 3. Natural Area Preserves with Intertidal Area in Puget Sound

Site Name	*MPA Category*[1]	*Year of Est.*	*Predominant Component*	*Sub-Tidal Y/N*	*Sub-Tidal Acres*	*Inter-Tidal Y/N*	*Inter-Tidal Acres*	*Up-land Y/N*	*Up-land Acres*	*Total Acres*	*Mgmt Plan Y/N*	*Marine Resource Protection/Restrictions (or comment)*
Dabob Bay NAP	Marine Habitat/ Nature Preserve	1987	intertidal	N	0	Y		Y		187	Y	No public access (except approved research projects and educational activities)
Kennedy Creek NAP	Marine Habitat/ Nature Preserve		upland	N	0	Y		Y		239	N	No public access (except approved research projects and educational activities)
Skookum Inlet NAP	Marine Habitat/ Nature Preserve	1986	intertidal	N	0	Y	53	Y	21	74	Y	

1. The MPA Categories used in this study are defined and discussed in Section 3.1.2.

Sources: Aberle, personal communication 1996; DNR 1988a; DNR 1988b; DNR 1989b; DNR 1996b.

Natural Features Reports describing resource status and threats are prepared for most designated and recommended NAPs (Friedman 1988; Caicco 1989). In general, the extent of marine-related resource study documented in these reports is limited.

At some NAPs, such as Skookum Inlet, the most waterward component of the site (tidal flats) is included for the purpose of buffering salt marsh communities from impacts that could originate from the intertidal area (DNR 1989b). As such, the tidal flats of the site receive indirect protection.

Management plans are required for NAPs, and have been completed for all of the intertidal sites except Kennedy Creek, where land acquisition is still in progress (Aberle, personal communication 1996; DNR 1988a; DNR 1988b; DNR 1989b). Supervision at these NAP sites varies, but in general consists of periodic DNR staff or volunteer steward visits and site inspections (Aberle, personal communication 1996; DNR 1996b). The only public access allowed at NAPs is for DNR-approved scientific research and educational visits.

In the early 1980s, the Natural Heritage Program studied the possibility of recommending a subtidal NAP near Sund Rock in Hood Canal (Heiser, personal communication 1997; Mills, personal communication 1997). The site was not designated a NAP, and some of the issues related to the decision provide insight on the challenge of designating NAPs as MPAs. It has been noted that the Sund Rock NAP proposal was faced with questions and concerns about the additional effort and resources involved in surveying, monitoring and managing the subtidal environment, as well as the dive surveys that would be necessary to determine if the area did in fact satisfy Natural Heritage Program priorities in terms of rarity and threat (Heiser, personal communication 1997; Mills, personal communication 1997). In the end, the area was not designated as a NAP (although certain fishery closures were subsequently put in place by the Washington Department of Fish and Wildlife — see Section 4.1.2). This example serves to illustrate the fundamental challenge of justifying the designation of a marine protected area given selection criteria that an area be of exceptional uniqueness or rarity. Furthermore, the "no access" level of protection provided by NAPs challenges resource managers and planners to consider the appropriateness and management feasibility of such an approach in the subtidal marine environment.

Overall, DNR's Natural Area Preserves, established through the Washington Natural Heritage Program, offer a high degree of site protection, but have thus far not been specifically directed toward marine species or ecosystems.

Natural Resources Conservation Areas

The Natural Resources Conservation Areas Act was passed by the state legislature in 1987, authorizing DNR to acquire property by any means other than eminent domain for the purpose of establishing Natural Resources Conservation Areas (NRCAs) (DNR 1992b). Much like Natural Area Preserves (previously discussed), Natural Resources Conservation Areas (NRCAs) strive to protect outstanding examples of native ecosystems and habitat for endangered, threatened and sensitive plants and animals. Unlike Natural Area Preserves, the NRCA Program represents a different concept toward conservation, in that it incorporates a blending of public use and natural resource protection goals. NRCAs provide opportunities for dispersed low impact public use and environmental education, provided such activities do not adversely affect the resource values to be protected (DNR 1992b).

The conservation purposes for NRCAs are defined though the following management objectives (DNR 1992b; RCW 79.71.030):

1) maintaining, enhancing, or restoring ecological systems, including but not limited to aquatic, coastal, riparian, montane, and geological systems, whether such systems be unique or typical of the state of Washington;
2) maintaining exceptional scenic landscapes;
3) maintaining habitat for threatened, endangered, and sensitive species;
4) enhancing sites for primitive recreational purposes; and
5) outdoor environmental education.

With regard to the above conservation objectives, NRCA Program policy considers natural resource-oriented purposes to have a higher priority over public-oriented purposes. This management emphasis guides the program in resolving conflicting public use and conservation issues (DNR 1992b).

The type of lands sought for NRCAs are defined as (DNR 1992b; RCW 79.71):

- Lands with a high priority for conservation, natural systems, wildlife and low-impact public use;
- An area of land or water — or land and water — with flora, fauna, geological, archaeological, scenic or similar critically important features that retains to some degree or has reestablished its natural character;
- Examples of native ecological communities; and
- Environmentally significant sites threatened by incompatible or ecologically irreversible developments.

Among areas containing the above elements, the NRCA Program gives priority to those areas with multiple features, such as geologic and scenic areas, cultural resources and threatened sites.

Since passage of the NRCA Act in 1987, 24 NRCAs have been designated, representing more than 50,000 acres (DNR 1997b).

NRCA Management Planning

DNR is required to produce a management plan for each NRCA. This planning effort is guided by a 1992 statewide management plan (DNR 1992b). The statewide plan provides direction and a standardized development approach for site management plans (DNR 1992b).
Each NRCA management plan is required to identify the following (DNR 1992b):

- Significant resources to be conserved and how they should be protected;
- areas with the potential for low-impact public and environmental education; purposes;
- types of management activities and public uses to be permitted;
- management policies and direction, protection needs and uses;

- other agencies which may assume management or cooperate; and
- times when the plan of subsequent activities will be submitted for public comment.

It should also be noted that before the writing of any site management plan, and before plans for or decisions about public use and education are made, a site inventory is required that identifies significant resources to be conserved (DNR 1992b).

The types of activities generally considered to be "low-impact" include (but are not limited to) (DNR 1992b):

- hiking
- primitive camping
- picnicking
- bird watching
- interpretive tours
- environmental education activities
- nature study
- photography
- scientific research
- other uses consistent with conservation purposes

In addition to the above public uses, NRCAs may also allow certain commodity-based activities to occur within site boundaries, such as agriculture and grazing, aquaculture and mining. However, all human activities and potential uses must first be evaluated to ensure that they are compatible with other uses, will not exceed the site's limits of acceptable change, are realistic in view of individual site characteristics and local conditions and are compatible with overall implementation strategies and program goals (DNR 1992b).

NRCA Rating by Natural Heritage Program

Under DNR's Natural Heritage Plan assessment of protected area designation security (previously described), Natural Resources Conservation Areas are ranked as secure, indicating that management designation cannot be readily changed or removed (DNR 1995). As for protection adequacy, the Natural Heritage Plan rates Natural Resources Conservation Areas as potentially adequate, and notes that such adequacy is dependent upon management planning for the individual sites (DNR 1995).

NRCAs as MPAs

NRCAs of Puget Sound

Of the 24 NRCAs designated throughout the state, six are located on shorelines of Puget Sound. However, only two of these six NRCAs actually contain intertidal area within their boundaries: Cypress Island NRCA in Skagit County and Woodard Bay NRCA in Thurston County near Olympia (Hurd, personal communication 1997; Powell, personal communication 1997). These sites are categorized in this study as Multiple Use Protected Areas[2]. The six NRCAs sites (shoreline and intertidal) are listed in **Table 4**.

Table 4. Natural Resources Conservation Areas with Intertidal Area and along Shores of Puget Sound[1]

Site Name	*MPA Category*[2]	*Year of Est.*	*Predominant Component*	*Subtidal Y/N*	*Subtidal Acres*	*Intertidal Y/N*	*Intertidal Acres*	*Upland Y/N*	*Upland Acres*	*Total Acres*	*Mgmt Plan Y/N*	*Marine Resource Protection/Restrictions (or comment)*
Sites with Intertidal Area within NRCA Boundaries												
Cypress Island NRCA	Multiple Use Protected Area	1987	upland	N	0	Y		Y		3587	Y	No specific fishery or marine resource restrictions at this time. (Increased marine resource protections may be implemented in phase 2 management planning.)
Woodard Bay NRCA	Multiple Use Protected Area	1987	upland	N	0	Y		Y		650	Y	No access in sensitive intertidal areas; access discouraged near adjacent marine mammal haulouts.
Shoreline Sites with No Intertidal Area within NRCA Boundaries												
Cattle Point NRCA		1991	upland	N	0	N	0	Y	93	93	N	(Unknown or none. No site management plan or documented restrictions.)
Hat Island NRCA		1991	upland	N	0	N	0	Y	91	91	N	(Unknown or none. No site management plan or documented restrictions.)
Lummi Island NRCA		1991	upland	N	0	N	0	Y	661	661	N	(Unknown or none. No site management plan or documented restrictions.)
Shipwreck Point NRCA		1990	upland	N	0	N	0	Y	472	472	N	(Unknown or none. No site management plan or documented restrictions.)

1. Intertidal NRCAs are considered MPAs in this study, while shoreline sites are not.
2. The MPA Categories used in this study are defined and discussed in Section 3.1.2.

Sources: DNR 1992b; DNR 1996a; Hixson, personal communication 1996; Hurd, personal communication 1997; Powell, personal communication 1997.

The Woodard Bay NRCA consists of 650 acres; it is predominantly an upland-based protected site that includes some intertidal area. Draft management plans for the site recognize the area's importance to marine species such as harbor seals and many marine-associated birds, and acknowledge that the intertidal estuarine habitat of the site is important to many species. Protection at this site is based largely on proprietary control of the lands included in the NRCA. Marine-associated human activities such as fishing or shellfish harvest are not subjected to site-specific regulation, either by WDFW, DNR or other jurisdiction authority. Boater access to nearby floating log booms is discouraged, as they provide a haulout site for marine mammals and also support seabirds and waterfowl (DNR 1996c). These particular features, however, are outside the NRCA boundary within the subtidal zone. Plans for implementing monitoring, research and environmental education programs have been suggested (DNR 1996c), but are not as yet fully implemented.

The Cypress Island NRCA consists of 3587 acres and is also predominantly upland-based, but it encompasses all of the island's tidelands to the extreme low tide line. While management focus is not currently targeted specifically at protecting marine habitats and species at a level found for terrestrial features of the island, this NRCA holds the potential for providing a great degree of marine-focused protection. Plans are underway to identify and assess sensitive and important marine resources surrounding Cypress Island, including those found in off-site subtidal areas, and consider them for inclusion within the NRCA (DNR 1996a; Randlette, personal communication 1996).

NRCAs as MPAs — General Observations

While it can be generally observed that the existing statewide system of 24 NRCAs is predominantly non-marine in nature, the program's scope could encompass marine area designations. By statute, the areas to be considered for NRCAs include "land or waters" (RCW 79.71.020). Thus far two intertidal NRCAs have been established, but there are not yet any subtidal sites. In looking toward the future, these two NRCAs serve as an indication that this conservation program has and can be applied toward protection of the marine environment.

Lack of Intertidal NRCAs

An additional point about the lack of intertidal area included in NRCAs should be noted here. Most of the shoreline-based NRCA sites listed above as excluding intertidal area (see Table 4) have state-owned public tidelands adjacent to their shore boundaries. Although these NRCAs have been designated for some years now, management development has not yet taken place at most of these sites. Given limited resources, DNR has had to move ahead slowly on management planning for these areas, focusing attention first on acquisition of areas to be protected (Hixson, personal communication 1996; Powell, personal communication 1997). As a general acquisition strategy, DNR gives a higher priority to obtaining upland areas at risk of development or other degradation than to the inclusion of public tidelands within Conservation area boundaries (Powell, personal communication 1997). The logic here is that public tidelands are not at risk of being sold to development interests, as is often the case for uplands. Furthermore, DNR has "flagged" those tideland parcels adjacent to their shore-based protected areas such that notification and special consideration will be given if ever a commercial aquatic land lease application should be received for such areas (Powell, personal communication 1997).
It is suggested that the DNR-managed public tidelands adjacent to these shore-based NRCAs can be supervised and managed, to some extent, as if they are part of the protected area (Kurowski, personal communication 1997; Powell, personal communication 1997). However, details on the extent to which such stewardship activities are directed toward marine resource protection is unknown.

State-wide NRCA Management Plan

The state-wide planning document for NRCAs, which guides the development of individual site management plans, does not set specific guidelines for public use activities associated with the marine environment. For example, the identification of low-impact activities, management actions, conditional and excluded uses and related NRCA policies has been noted for hiking, camping, picnicking, agriculture, grazing, mining, weed control, forestry, fire management, roads, vehicles, pets, plant collection, hunting, trapping and firearms (DNR 1992b). Not mentioned, however, are marine associated activities such as fishing or other forms of marine harvest, vessels and anchorage. The regulatory authority for managing these types of marine activities is not specifically contained within the NRCA program.

The only specific mention of the marine environment provided by the state-wide NRCA management plan is a discussion of the process for including state-owned aquatic lands within the boundaries of a site. The process is explained as follows (DNR 1992b):

State-owned aquatic lands adjacent to an NRCA may be considered for inclusion
within the boundary of the NRCA, and managed according to the NRCA State-wide Management Plan, under one of the following:

— A no-fee lease agreement may be considered by DNR's Aquatic Lands Division
Manager for state-owned lands used for recreation and public access, subject to the provisions of WAC 332-30-131.

— DNR's Land and Water Conservation Division may nominate state-owned aquatic lands adjacent to NRCAs for Reserve status, subject to the provisions of WAC 332-30-151.

The "Reserves" mentioned above and the provisions for their designation per WAC 332-30-151 were previously discussed under "Aquatic Lands (Marine) Reserves."

DNR Summary Remarks

Given DNR's responsibility for aquatic lands management and administration of the Natural Heritage Program and Natural Resources Conservation Area Program, a diverse and broad spectrum of environmental protection mechanisms are offered, and play an important role for the establishment of MPAs in Puget Sound. Perhaps no other state agency has so many protected area tools available and applicable to the marine environment. As such, DNR is and will continue to be an important agency in all marine protected area developments. A summary of key observations about DNR programs and their role and potential as marine protected areas follows.

DNR manages state aquatic lands as a public resource for the benefit of current and future citizens. In carrying out this mandate, DNR is directed by a broad set of management responsibilities and goals, including the assurance of public use of and access to aquatic lands, fostering water-dependent uses, promoting renewable resource production, allowing for mineral and material production, ensuring environmental protection and generating income (DNR 1992a; WAC 332-30-100). Within this management framework there exists by statute the ability, but not mandate, for DNR to establish marine reserves in areas with special educational, scientific or environmental importance (RCW 79.68.060). MPA establishment potential and support is also linked to DNR's management jurisdiction over aquatic plants and affixed aquatic animals on state lands, as well as the agency's ability to withdraw public tidelands and bedlands.

Within Puget Sound, a total of five intertidal DNR-established marine protected areas are identified in this study: three NAPs (Table 3) and two NRCAs (Table 4). The boundaries of other NAP and NRCA sites abut, but do not encompass, intertidal or subtidal areas.

While the NAP system provides the highest level of protection among DNR protected areas, it has to date been predominantly directed toward the protection of terrestrial ecosystems. The NRCA system provides a balanced approach of resource conservation and low-impact public use, but has been mainly upland focused with only two sites currently containing intertidal area in Puget Sound. Plans for the study and possible inclusion of subtidal marine resources at Cypress Island NRCA suggest the potential for further MPA development.

4.1.2 Washington Department of Fish and Wildlife

The Washington Department of Fish and Wildlife (WDFW) is responsible for the preservation, protection, perpetuation and management of the fish and wildlife of the State of Washington. In carrying out this broad responsibility, WDFW is organized into programs and major divisions including, but not limited to, those involved with the regulation and management of fisheries, wildlife and habitat.

A number of WDFW regulations and programs, most originating from the formerly separate Departments of Fisheries and Wildlife[3], have contributed to the establishment and management of a variety of marine protected areas in Puget Sound. Among these, various fishery management areas and protected intertidal land designations make up the diverse patchwork collection of MPAs discussed here. Also presented in this overview of WDFW will be some comment on the potential for MPA development in light of the goals, objectives and limitations of various WDFW programs.

An overview of WDFW fisheries management programs and MPAs is presented first, followed by a similar review of wildlife and habitat management programs.

Fisheries Management

There is no "protected areas" program per se within WDFW's fisheries management regulations and programs, as was the case with DNR (previously discussed at Section 4.1.1). Yet, WDFW's responsibility for the management of fisheries is crucial to the establishment of many existing marine protected areas.

The marine resource protection and conservation tools available through WDFW fisheries management programs are structured, by statute, using an approach that is largely species-based. WDFW has authority to regulate the time, place and manner of specific fishery resource harvests.

Treaty Tribes and WDFW Fisheries Management

Before further describing the fisheries management authority of WDFW, it is important to note, at the outset, that this authority is shared with Washington's Indian Treaty Tribes. With a possible exception for conservation purposes, WDFW (and other state agencies) may not regulate Treaty Tribes fishing. As cooperative managers of the state's fishery resources, the Treaty Tribes and WDFW work to carry out fishery management activities and abide by regulations or closures based upon joint harvest management plans and agreements (Bradbury, personal communication 1997c). Throughout this section on WDFW, discussion of the agency's fishery management authority is directed toward non-Treaty Tribes harvest activities. Section 4.3 discusses further the role of Treaty Tribes and MPAs.

Following is a brief description of the general fisheries management responsibilities of WDFW.

Game Fish

Game fish (listed in **Appendix C1**) are defined as those fish species of the class *Osteichthyes* that cannot be fished for except as authorized by WDFW. WDFW has a mandate to manage game fish so as to maximize public recreational opportunities without impairing the supply of wildlife (RCW 77.12.010). In managing these fish species the Washington Fish and Wildlife Commission (the Commission) may adopt rules to establish "closed waters where fishing for game fish may be prohibited" (RCW 77.12.040).

Foodfish and Shellfish

The term "food fish" defines those fish species of the classes *Osteichthyes*, *Agnatha*, and *Chondrichthyes* that have been classified by WDFW and that shall not be fished for except as authorized by rule of the commission (RCW 75.08.011(13)) (**Appendix C2**). Similarly, "shellfish" is defined as those species of marine and freshwater invertebrates that have been classified and that shall not be taken except as authorized by rule of the commission (RCW 75.08.012 (14)) (**Appendix C3**).
Similar to game fish management, WDFW manages food fish and shellfish for the primary purposes of preserving, protecting and perpetuating these resources. WDFW is directed to carry out this mandate so as to "maintain the economic well-being and stability of the fishing industry," to "promote orderly fisheries" and to "enhance and improve recreational and commercial fishing in the state" (RCW 75.08.012). To this end, WDFW may adopt rules specifying "areas and waters where harvest is unlawful" (RCW 75.08.080).

Concerning shellfish, there is an important limitation to note regarding the regulatory authority of WDFW.

Under state law, embedded shellfish (including clams, oysters, cockles, borers and mussels) on private tidelands are considered the property of the land owner. As such, harvest closure for these embedded shellfish on such private tidelands is not within the authority of WDFW (Mills, unpublished 1995; RCW 75.08.080(1)(f)). Additionally, DNR also has proprietary jurisdiction over those embedded aquatic animals (and affixed aquatic plants) found on state-owned aquatic lands (DNR 1992a).

WDFW Harvest Closure Areas and MPAs

Ten MPAs established or supported by WDFW harvest closures are identified in this study. These areas are specifically defined locations where state laws have established year-round harvest closures for one or more species to provide long term resource protection. This includes harvest closure areas where the reasoning behind provision of long term resource protection is to support recreational, research or multiple use purposes. Most of these MPAs have been specifically designated as marine preserves.

The ten identified MPAs are categorized as follows: one Multiple Use Protected Area, two Recreational Marine Preserves, five Research and Educational Marine Preserve sites, and two Marine Species Preserve sites. **Table 5** presents the WDFW fishery closure areas identified in this study as MPAs.

In many cases, the WDFW harvest closures to support or establish these MPAs were spurred by requests for such protection from the public or other institutions. Such was the initial driving force behind closures at Titlow Beach in Tacoma, Sund Rock in Hood Canal, and five San Juan Island Marine Preserve Areas. Additionally, at Edmonds Underwater Park, the City of Edmonds enacted its own harvest restrictions several years before site-specific regulations were adopted by WDFW.

General observations about these existing MPAs and WDFW's involvement are presented next.

Titlow Beach Marine Preserve Area

Titlow Beach Marine Preserve was established to support research and educational activities, and to provide a non-consumptive recreational diving area. As such, it is categorized in this study as a multiple-use protected area.

In the early 1990s, science teachers from the nearby Bellarmine Preparatory high school were motivated to establish Titlow Beach as a preserve area where students could study a relatively undisturbed marine environment. Kelp and other marine life had become less abundant over years of consumptive use in the area. Scuba diving groups, recognizing the Titlow Beach area as a high quality diving site, were also interested in the establishment of the site as a preserve. These groups and others, working closely with the Metropolitan Park District of Tacoma helped to form early plans for the MPA (Weathers, personal communication 1997a).

Local efforts developed into requests for WDFW to close the waters off of Titlow Beach to harvest. Following a public scoping and review process, WDFW enacted harvest closure regulations in March of 1994. At the approximately 56 acre (Higgins, personal communication 1997) Titlow Beach Marine Preserve, WDFW prohibits all take of shellfish (WAC 220-56-307) and food fish, except for salmon fishing with artificial lures from shore or a non-motorized vessel (WAC 220-56-128). Additionally, seaweed harvest is prohibited under a local ordinance. The site is managed by the Metropolitan Park District of Tacoma, and enjoys a high level of community support and stewardship.

Edmonds Underwater Park / Brackett's Landing

The Edmonds Underwater Park (a City of Edmond's park adjacent to the upland park at Bracketts Landing) can be categorized as a Recreational Marine Preserve MPA. WDFW has adopted harvest closure regulations for this site. This twenty-seven acre site (approximately 25 of which are subtidal and intertidal), provides scuba divers with a variety of man-made underwater trails and features, attracting and providing habitat for marine life in a non-consumptive setting.

In 1970, the City of Edmonds enacted ordinances for underwater parks prohibiting the "taking or possession of any fish, bivalve, mollusk, crustacean or any other type of marine organism, whether plant or animal, of any kind and description" (City of Edmonds Ordinance 5.32.060). Because of this long-standing policy and the consistent and focused efforts of volunteers, Edmonds underwater park is said to be the longest established "no-take" MPA in all of the Pacific Northwest (Lamb 1996). In the 1980s, WDFW enacted state regulations to close a portion of the park to the take of food fish and shellfish (WAC 220-56-130)[4].

Sund Rock Marine Preserve Area

WDFW fishery closure restrictions at a small marine area surrounding Sund Rock in Hood Canal have been enacted to provide conditions supportive of a recreational diving area. As such, Sund Rock is categorized in this study as a Recreational Marine Preserve.

Originally, in the early 1980s, Sund Rock was considered by the Washington Natural Heritage Council for designation as the state's first underwater Natural Area Preserve (NAP)[5] (Heiser, personal communication 1997; Mills, personal communication 1997a). While the area was not adopted as a NAP, community interest in restricting harvest activities at the site remained. Building on the active support of scuba diving groups, local landowners and citizens, a proposal was brought to WDFW.

In 1994, following a public scoping and review process, WDFW adopted rules prohibiting the take of shellfish other than shrimp and food fish other than salmon from waters within 200 yards of the floating salmon aquaculture net pens near Sund Rock (WAC 220-56-307; WAC 220-56-128). The salmon and shrimp exceptions were based on concerns expressed by user groups during public comment on the proposed site, and were considered by WDFW to be compatible with use of the area as a recreational dive site (Mills, personal communication 1997a).

The Marine Preserves and Closed Sea Urchin and Cucumber Areas of the San Juan Islands

The San Juan Islands marine waters contain a somewhat complex scheme of related and overlapping marine preserves and closed fishery areas. The area hosts five relatively small MPAs categorized in this study as Research and Educational Marine Preserves. These preserves are partially overlapped by two special fishery management areas (categorized in this study as Marine Species Preserves) that are closed to commercial harvest of sea urchins and sea cucumbers. A brief explanation of the purpose of and relationship between these areas is necessary in order to describe the role of WDFW at these MPAs.

Commercially Closed Sea Urchin and Sea Cucumber Areas

As early as 1972, WDF closed a fairly large section of San Juan and Upright Channels in the San Juan Islands to the commercial harvest of sea cucumbers and sea urchins. Sometime between 1979 and 1987, a second area in Haro Strait was closed to these harvests (**Table 5**). Two additional small areas in the San Juans (at Green Point on Spieden Island and Gull Reef) were also closed to these fisheries (establishment dates uncertain).

These special management fishery areas serve the purposes of functioning as control areas to assess the impacts of fisheries, and providing harvest refugia as a management strategy (Bradbury 1996). In the late 1980s, WDF envisioned that these closed areas (specifically, the two larger areas) could serve as a protective "buffers" around smaller, stricter marine preserves that were being proposed (to be discussed) (WDF 1988). For several years, WDFW has conducted a wide variety management-related studies at these sites, including sea urchin growth mortality studies, and abundance estimates for sea cucumbers and urchins at fished and unfished areas (Bradbury 1996).

As is common with fishery management areas, these sea urchin and sea cucumber closure areas are not necessarily permanent in their establishment. In October of 1997, following negotiations with various Treaty Tribes, two of the four commercially closed sea urchin and cucumber sites (at Gull Reef and Green Point) were re-opened by WDFW (Bradbury, personal communication 1997b). The state and tribes are continuing negotiations concerning these and other closed shellfish areas, and additional changes and possible re-openings of closed areas are a possible outcome (Bradbury 1996; personal communication 1997a, 1997b).

San Juan Island Marine Preserve Areas

In the late 1980s, the University of Washington's Friday Harbor Laboratories (FHL) approached WDFW and expressed serious concerns about rapidly growing sea urchin and sea cucumber fisheries in the San Juan Islands, noting wide-spread poaching in closed areas and off season, enforcement problems, and potential adverse impacts to these resources. FHL proposed to WDFW the establishment of eight marine preserve areas, to be located mostly adjacent to UW-owned uplands and tidelands, and to be set aside for scientific research and education (WDF 1988a). The intent was that these preserves should be closed to all commercial and recreational fisheries. This could provide, it was argued, protected areas necessary for research use, including collection of specimens, by the Friday Harbor Laboratories and others for field experiments, long term studies and as control sites for comparison to harvested areas (WDF 1990).

WDFW took the proposal under consideration, and through a public review process weighed the varied interests of those opposed and in support of the preserves. The outcome, in 1990, was the WDFW establishment of five MPAs known collectively as the San Juan Islands Marine Preserve Areas (see **Table 5** for brief description).

At these Preserves, WDFW prohibits the take of shellfish, except crab in Parks Bay (WAC 220-20-307; WAC 220-20-025), bottomfish (WAC 220-56-230) and all food fish except herring; and except salmon for commercial purposes (WAC 220-56-020). These exceptions reflect that WDFW, in considering closure of areas, must attempt to balance the competing and often conflicting uses of fishing and other forms of harvest with the need for resource conservation and protection.

Due to resource constraints, enforcement and monitoring programs have not been developed specifically for the Preserves. FHL staff and researchers provide some informal supervision at these Preserves, and approach potential violators with an educational approach (Duggins, personal communication 1997; Johns, personal communication 1997; Staude, personal communication 1997). Monitoring has not been systematically carried out at these preserves. However, WDFW recently surveyed rocky reef fish populations in a portion of the preserves (Friday Harbor-to-Point Caution site) in an effort to assess the function and effectiveness of Preserve areas. The study, which compared fished and protected sites, noted that although Shady Cove was part of a relatively new MPA (of four years at the time of study), it contained greater abundance and larger sizes of select bottomfish than that found at fished sites (Palsson and Pacunski 1995).

WDFW and No-Take MPAs

As previously mentioned in Section 2.1.2, a "no-take" MPA is one in which no marine life, regardless of management classification, may be harvested or otherwise taken. The only such area that appears to be a "no-take" MPA in Puget Sound is Edmonds Underwater Park, where a combination of WDFW regulations, Treaty Tribes agreements and the City's own "no-take" ordinance are in place. Although WDFW has not yet independently established a "no-take" MPA, the agency's scope of authority appears to support this possibility.

Subject to exception for or agreement by affected Treaty Tribes, WDFW can regulate (and prohibit) the harvest of food fish and shellfish under Title 75 (Fisheries Code) of the Revised Code of Washington. WDFW can also prohibit the take of all other species under Title 77 (the Wildlife Code). Finally, prohibition of aquatic plant removal may be within WDFW's authority on intertidal lands held by the Department (Mills, personal communication 1997b). DNR, however, has the broadest authority for regulation of aquatic plant removal.

Table 5. Existing Marine Protected Areas in Puget Sound Established or Supported by WDFW Fisheries Regulations/Management

Site Name or Location	*MPA Category*[1]	*No. of sites*	*Year of Est.*	*Sub-tidal Y/N*	*Inter-tidal Y/N*	*Up-land Y/N*	*Total Acres*	*Mgmt. Plan Y/N*	*WDFW Fisheries Regulations (and comments)*
Titlow Beach Marine Preserve Area[2]	Multiple Use Protected Area[3]	1	1994	Y	Y	N	55.6 (est.)	Y	No take of shellfish or food fish, except salmon fishing with artificial lure from shore or non-motorized boat (WAC 220-56-128; 220-56-307; 220-20-025). (Metro. Park District of Tacoma prohibits seaweed collection.)
Edmonds Underwater Park[4]	Recreational Marine Preserve	1	1970	Y	Y	N	27	Y	Since 1970, the City of Edmonds has prohibited the take of *any* marine life. In a portion of the park, WDFW prohibits take of foodfish or shellfish (WAC 220-56-130; 220-20-025). (As of late 1997, a WDFW proposal was under consideration to expand the state closed area to match City park boundaries)
Sund Rock	Recreational Marine Preserve	1	1994	Y		N		N	No take of shellfish, except shrimp; No take of food fish, except salmon and trout (WAC 220-56-128; WAC 220-56-307).
Closed Sea Urchin and Sea Cucumber Areas	Marine Species Preserve	2	1972 1979-1987	Y	Y	N		N	No commercial harvest of sea urchins or sea cucumbers at two areas in the San Juans: a portion of Haro Strait, and a portion of San Juan and Upright Channels (WAC 220-52-071; WAC 220-52-073).
San Juan Island Marine Preserve Areas	Research and Educational Marine Preserve	5	1990	Y	Y	N		N	No take of shellfish except crab in Parks Bay (WAC 220-56-307; 220-20-025); no take of bottomfish (WAC 220-56-230); and no take of food fish except herring ; and except salmon for commercial purposes (WAC 220-20-020).

Notes:

[1] The MPA Categories used in this study are defined and discussed in Section 3.1.2.

[2] Primary on-site management by Metropolitan Parks District of Tacoma.

[3] Characterized as "multiple use" in the sense that primary objectives are supportive of both recreational (scuba diving) and research/educational uses.

[4] First established by, and subsequently managed by, the City of Edmonds.

Proposed MPAs under Consideration by WDFW

In 1997, WDFW received requests and put forth proposals for the establishment of twenty-three no-take harvest closure areas (WDFW, unpublished 1997a). This is an unprecedented level of such requests for the agency (Mills, personal communication 1997c). Many of the requests were received by WDFW from scuba diving groups, while others were put forth by the agency. After initial agency and public review, the list of areas remaining for consideration was narrowed to five (**Table 6**), and an agency decision is expected in early 1998.

Table 6. Puget Sound No-take MPA Proposals Under WDFW Consideration (as of late 1997)

Area Name	Proposed Site Location/Comments
Octopus Hole	In Hood Canal, from the boat launch in Lilliwaup Bay southeast 1500 yards, then south-southwest parallel to shore to the Rest-A-While Resort, then due west-northwest to shore, excluding shoreward of the -10 foot MLLW contour.
Orchard Rocks	A 1000 foot radius around Orchard Rocks, located in Rich Passage near the southern end of Bainbridge Island.
Edmonds Underwater Park	This proposal would change the legal description of the closed area at Edmonds Underwater Park to encompass 1800 feet of shoreline instead of the 250 feet now closed.
City of Des Moines Park	This proposal would close the area to any harvest. The City of Des Moines has already closed harvest as land-owner and manager of this park. This was done to protect the park-type value of the area and to ensure a diversity of flora and fauna on these heavily visited beaches. In addition, given the proximity of sewer outfalls and combined sewer overflows, there is a concern for public health. Closure under WDFW regulations will ensure consistency of regulation between the City and WDFW and legally close harvest for all species at this site.
South 239th Street Park	This proposal would close the area to any harvest. The City of Des Moines has already closed harvest as land-owner and manager of this park. This was done to protect the park-type value of the area and to ensure a diversity of flora and fauna on these heavily visited beaches. In addition, given the proximity of sewer outfalls and combined sewer overflows, there is a concern for public health. Closure under WDFW regulations will ensure consistency of regulation between the City and WDFW and legally close harvest for all species at this site.

Sources: (WDFW, unpublished 1997a; Mills, personal communication 1998)

Closed Fishery Areas Excluded and Potential MPAs

It is important to note that there are numerous areas in Puget Sound closed to recreational or commercial fishing or shellfishing for certain managed species, but not all such locations have been identified here as MPAs. Typical of traditional fisheries management approaches, but not consistent with the concept of a marine protected area, the harvest closures for many Puget Sound areas are regularly subject to change and/or have been established for reasons other than long-term marine resource protection (Mills, personal communication 1997b).

WDFW fishery management areas not identified in this study as MPAs include locations where closures are seasonal (as opposed to year-round) or periodic; areas with specific gear restrictions, catch limits or other controls; and areas closed due to pollution and human health concerns. However, there are still a number of "gray areas" for which sufficient information was not readily available to allow for conclusive determination of a closed fishery area as an MPA. Some of these areas, which might be considered MPAs given additional investigation, are listed at **Appendix B** under the category of Potential/Possible MPAs.

Fisheries Management Conclusion

Given that WDFW has the authority to close waters to the take of game fish, food fish and shellfish and has a mandate to preserve, protect, enhance and manage these resources (RCW 77.12.010; RCW 75.08.012; RCW 75.08.012), it is possible for marine protected areas to be established by the agency. A number of such WDFW

fishery closure areas already exist (**Table 5**), supporting one Multiple Use Protected Area, two Recreational Marine Preserves, five Research and Educational Marine Preserve sites, and two Marine Species Preserve sites.

While each of the MPAs supported by WDFW fishery closures is unique in purpose and extent of protection provided, it would appear that most of these sites share a common designation history. The establishment of most of these MPAs has been spurred by focused public and institutional appeals for WDFW to close specific areas to harvest.

To complete the picture of WDFW and its role with regard to MPAs, the wildlife and habitat management functions of WDFW are discussed next.

WDFW Wildlife and Habitat Management

There are over 840,000 acres of lands under WDFW acquisition and management (WDFW 1996b). Much of these lands are protected areas, and are focal points for a variety of WDFW wildlife management and habitat protection programs. Many of these land-based efforts, to be discussed here, provide the potential for marine protected area development in intertidal environments, and some have resulted in MPAs.

"Wildlife" Defined

Under RCW 77.08.010(16), "wildlife" means all species of the animal kingdom whose members exist in Washington in a wild state. This includes but is not limited to mammals, birds, reptiles, amphibians, fish, and invertebrates. Concerning fish and invertebrates, however, the term "wildlife" does not include those fish, shellfish, and marine invertebrates classified as food fish or shellfish (as previously described and listed in Appendix C2 and C3). This distinction between wildlife and food fish and shellfish established, in a general sense, the historical division of jurisdictional responsibilities between the former Departments of Wildlife and Fisheries.

Wildlife Management and Habitat Goals

Title 77.04 of the Revised Code of Washington, known as the "Wildlife Code of the State of Washington" directs WDFW to establish "policies to preserve, protect, and perpetuate wildlife, fish, and wildlife and fish habitat" so as to "maximize fishing, hunting, and outdoor recreational opportunities compatible with healthy and diverse fish and wildlife populations" (RCW 77.04.055(1)). In carrying out these mandates, WDFW is authorized to establish "hunting, trapping, and fishing seasons and prescribe the time, place, manner, and methods that may be used to harvest or enjoy game fish and wildlife" (RCW 77.04.055(2)).

Specific WDFW programs that deal with wildlife management and habitat protection are numerous and varied. Perhaps the best overall summary of WDFW priorities concerning wildlife and habitat management, and one that provides some insight to the forthcoming discussion of the extent and possibilities of these programs for protecting marine areas, is found in the most recent statement of goals, policies and objectives released by the Washington Fish and Wildlife Commission (WDFW 1995a). **Table 7**, below, presents Wildlife Management and Habitat goals as stated in this document.

Table 7. Habitat and Wildlife Management Goals for the Washington Department of Fish and Wildlife[1]

Habitat Goals	Wildlife Management Goals
• Maintain historic habitat diversity • Secure the habitats needed to ensure the integrity of natural ecosystems. • Achieve long-term net gains in area and function of priority habitats. • Maintain and enhance habitat conditions statewide that support healthy, well distributed populations of Washington's native and desirable non-native wildlife species. • Achieve public involvement from citizens interested in Washington's wildlife and build bridges of understanding with them and their elected representatives. • Secure, maintain and enhance lands and sites for public wildlife and fish recreational access and opportunity. • Develop and implement Wildlife Area management plans.	• Maintain the historic statewide diversity of native wildlife species. • Determine the ecological needs and population status of wildlife species of concern. • Develop an inventory of the current habitats of wildlife populations. • Protect and manage for recovery all native wildlife classified as endangered, threatened or sensitive. • Maintain the genetic integrity of wildlife populations. • Manage game populations for sustainable natural production where feasible. • Maximize wildlife recreational opportunities.

1. These broad management goals apply to all functions within WDFW. Habitat goals pertain to fish as well as wildlife.

Source: Washington Department of Fish and Wildlife (WDFW). 1995. Goals, Policies and Objectives by the Washington Fish and Wildlife Commission.

The goals related to "area" protection reflect WDFW efforts to acquire, maintain and enhance habitats for natural ecosystems, priority habitats (those needed to support endangered, threatened, sensitive or candidate species — to be discussed at a later point in this section) and for providing wildlife- and fish-related recreational opportunities. Also specifically mentioned are Wildlife Areas, a type of designated protected area that originated with the former Department of Wildlife and that has contributed to some MPA representation in Puget Sound.

Wildlife Areas and a few other protected areas are discussed next in terms of their role as MPAs.

Wildlife and Habitat Areas as MPAs

WDFW manages more than 840,000 acres of state lands. Below is a brief overview of various WDFW protected area programs that have established land-based MPAs in Puget Sound. These MPAs include three Wildlife Areas, a Natural Area Preserve and a Seabird Sanctuary (**Table 8**).

Table 8. Existing and Potential Marine Protected Areas in Puget Sound Established through Wildlife/ Habitat programs of WDFW

Site Name	*MPA Category*[1]	*No. of sites*	*Year of Est.*	*Total Acres (if known)*	*Mgmt. Plan*	*WDFW Marine Resource Protection Regulation (or comments)*
South Puget Sound Wildlife Area	Marine Habitat/ Nature Preserve	1	1988	4,575	Y (in draft)	No public access to McNeil, Gertrude and Pitt Islands, including tideland areas; no consumptive use policy.
Skagit Wildlife Area	Multiple Use Protected Area	1	1948 thru 1992	13,000	Y (in draft)	No specific marine resource protection restrictions. Upland and intertidal area is set aside/designated for habitat preservation. (In-progress management planning considering restrictions on commercial shellfishing, air boats and motorized personal watercraft)
Nisqually Wildlife Area	*Potential* Multiple Use Protected Area	1		622	N	No specific marine resource protection restrictions. Upland and intertidal area is set aside/designated for habitat preservation.
Lummi Island Natural Area Preserve	Marine Habitat/ Nature Preserve	1	199?	708	N	All Natural Area Preserves are off-limits to public access (although this is not strictly enforced at this site.) (Rodrick, personal communication 1997).
Zella M. Schultz Seabird Sanctuary	Marine Habitat/ Nature Preserve	1	1975	48	Y	(No specific WDFW regulations. Marine area protection provided by adjacent no-access marine buffer zone. Site cooperatively managed by WDFW and USFWS) (Edens, personal communication 1997).

1. The MPA Categories used in this study are defined and discussed in Section 3.1.2.

Sources: WDFW 1995b; WDFW 1996; Edens, personal communication 1997; Kessler, personal communication 1997; Rodrick, personal communication 1997.

It should also be noted that the extent of WDFW Puget Sound intertidal land holdings is not limited to the sites presented here as MPAs. This review of WDFW land-based MPAs should be considered preliminary in that it does not reflect a comprehensive assessment of all intertidal holdings by the Department and therefore may overlook some areas that could be considered MPAs. The sites recognized in this study as WDFW land-based MPAs are those that have been designated as protected areas of various types.

Wildlife Areas

At some 25 sites throughout the state, WDFW manages large tracts of lands that are designated as Wildlife Areas (WDFW 1997c). Wildlife Areas are established by WDFW for the purpose of protecting and improving land and water habitats to assure optimal numbers, diversity and distribution of wildlife for the welfare of the people of Washington State (DNR 1995, B-5). While many of these areas were originally established primarily for the management of game species, they are now recognized as nongame habitat as well (DNR 1995).

Wildlife Area Directives, Goals and Policies

Presented here are statements and short lists of directives, goals and policies that explain the purpose of and areas of focus for Wildlife Areas.

Overarching WDFW directives that pertain to Wildlife Areas include the Department mandates to:

- Preserve, protect and perpetuate wildlife (RCW 77.12.010).
- Maximize game fish, hunting, and outdoor recreational opportunities compatible with healthy and diverse fish and wildlife populations (RCW 77.04.055).
- Secure the habitats needed to ensure the integrity of natural ecosystems, maintain or enhance the diver sity and abundance of wildlife populations and maximize wildlife associated recreation (WDFW 1996b).

Adding to these general directives, the Washington Fish and Wildlife Commission has set a specific goal for WDFW to develop and implement management plans at all Wildlife Areas (WDFW 1995a).

In keeping with these directives, some of the operational policies that WDFW has developed for the manage-ment of Wildlife Areas include:

- Purpose of Management: To benefit wildlife and habitats, and to provide compatible wildlife recreation and education (WDFW 1996b).
- Habitat: The department's primary approach to maintaining healthy wildlife populations is through the protection or enhancement of wildlife habitat. Land use decisions on Wildlife Areas will be based on benefits to wildlife and habitat (WDFW 1996b).
- Public or Commercial Use: "New activities, or significant changes in traditional activities, proposed outside of the management plan process may result in conflicts. If such conflicts cannot be resolved through constraints or mitigation, the Department will subordinate non-wildlife-related public or commercial use to the protection of wildlife habitats and the maintenance of wildlife-related recreation" (WDFW 1996).

These combinations of directives, goals and policies consistently suggest that Wildlife Areas are to be planned multiple-use areas that protect and enhance wildlife and habitats while encouraging compatible wildlife-related recreational and educational use. As such, the three Wildlife Areas recognized as existing or potential Puget Sound MPAs have been categorized in this study as Multiple Use Protected Areas.

Wildlife Area Rating by Natural Heritage Program

Under DNR's Natural Heritage Plan assessment of protected area designation security, WDFW Wildlife Areas are ranked as "secure," indicating that management designation cannot be readily changed or removed (DNR 1995). As for protection adequacy, the Natural Heritage Plan rates Wildlife Areas as "not adequate," meaning these areas are not thought to be able to assure the survival of the various Natural Heritage elements into the foreseeable future (DNR 1995).

Wildlife Areas of Puget Sound

There are three Wildlife Areas that contain intertidal lands (but not subtidal area) within Puget Sound: the South Puget Sound Wildlife Area; the Skagit Wildlife Area; and the Nisqually Wildlife Area (**Table 8**). These sites are categorized in this study as, respectively, a Marine Habitat/Nature Preserve, a Multiple Use Protected Area, and a Potential/Possible MPA. Brief descriptions of each site, and in particular their role or potential as MPAs, are presented here.

South Puget Sound Wildlife Area

The South Puget Sound Wildlife Area was established in 1988 and includes five satellite areas comprising 4,575 acres in Pierce County (WDFW 1995c). The majority of this acreage is represented at three of the five areas: McNeil, Gertrude and Pitt Islands. All of the adjacent tidelands (to the line of extreme low tide) are included within the boundaries of the Wildlife Area (WDFW 1995c; Kessler, personal communication 1997).

Gertrude Island has the largest haulout site for harbor seals in all of southern Puget Sound, and has been the focus of extensive marine mammal research since the early 1970s. Habitat protection for the harbor seals and for other marine life found on shores or within the intertidal zone is provided by restrictions to public access and a non-consumptive policy for the entire Wildlife Area.

South Puget Sound is the only Wildlife Area in the state to be managed entirely for non-consumptive recreational and education use (WDFW 1995c). This policy originated from the terms of a 1984 federal land transfer deed that called for WDFW to manage these islands as "a sanctuary for the unmolested feeding and breeding of wildlife" and stipulated these lands be "specifically unavailable to the public" (WDFW 1995c). The effectiveness of this no-access policy is increased by the presence of a federal correctional facility located at McNeil Island that has strictly prohibited public access since 1875 (WDFW 1995c; Kessler, personal communication 1997). Given that this policy continues to be applied to these islands, including the intertidal zone, the South Puget Sound Wildlife Area functions as a marine protected area, and is categorized in this study as a Marine Habitat/Nature Preserve.

Revised management planning is currently in progress for the South Puget Sound Wildlife Area. Under the direction of a WDFW Cross-Divisional Task Team with input from a Citizen's Advisory Group and others, a management plan, the first for the site, is currently being drafted (WDFW 1995c).

The first draft of the Wildlife Area's management plan featured some focus on marine resources and issues concerning their protection. The harbor seal haulout areas were identified as a "Sensitive Animal Species Zone" and as such were to be given top management priority (WDFW 1995c). However, when this draft plan was sent out for agency review, many comments were received that suggested WDFW should give more consideration to the marine resources and management issues pertaining to the intertidal areas of the site (Kessler, personal communication 1997). In response to comments received, subsequent drafts of the management plan will incorporate an "intertidal management zone" and will seek to clarify the Wildlife Area's policy on the prohibition of marine life collection or harvest (Kessler, personal communication 1997).

Skagit Wildlife Area

The approximate 13,000 acres of predominantly intertidal lands that make up the Skagit Wildlife Area were acquired over a period from 1948 through 1992 (WDFW 1996b). This river delta site includes large areas of intertidal mud flats and marsh, and is one of the major waterfowl wintering areas on the Pacific Flyway. The importance of the area's habitat to migrating waterfowl provided the initial justification for the purchase of lands for the Wildlife Area, and remains the site's primary management focus. Fishing, shellfishing and waterfowl hunting are major activities at the site and throughout the area, as well as non-consumptive uses such as hiking, birdwatching. photography and canoeing (WDFW 1996b).

As an MPA, the Skagit Wildlife Area is categorized in this study as a Multiple Use Protected Area. To the extent compatible with a primary objective of habitat and wildlife protection, there is also a goal to maximize wildlife-associated recreational opportunities (WDFW 1996b). However, in contrast to the "no consumptive use" policy in place at the South Puget Sound Wildlife Area, the Skagit Wildlife Area does allow consumptive uses, including fishing.

New management planning underway for the Skagit Wildlife Area holds some promise for increasing the level of marine resource protection provided at the site. A ten-member WDFW Cross-Divisional Task Team and a Citizen's Advisory Group have been working on drafting a management plan for the Wildlife Area in response to changes over time in habitat conditions and public expectations and priorities. Through this planning process, the scoping of public issues and concerns, mapping and assessment of resources and identification of priority management zones have resulted in the drafting of a diverse set of proposed management actions (WDFW 1996b).

Because the management planning effort currently underway for the Skagit Wildlife Area was initiated in 1992 by the former Washington Department of Wildlife, the full scope of fisheries management issues, especially salmon and steelhead stocks and habitat, are not yet reflected in these planning efforts. However, a WDFW planned phased process applicable to this and other Wildlife Areas calls for salmon and steelhead habitat inventories to be completed, which will include evaluation of regulatory parameters and ecosystem standards, and the proposal and prioritization of management activities to improve conditions. Completion of these salmon and steelhead evaluations is scheduled for one year after completion of the Skagit Wildlife Area management plan, with plan updates and public review processes to follow (WDFW 1996b).

Although marine resource issues such as fish habitat are not a central focus of the current management planning effort, a few priority management issues are related, if indirectly, to the marine environment and its protection. For example, concerns about commercial clam digging on the site and the disturbance this activity causes to the soil profile (and the subsequent invasion of non-native vegetation) have led to consideration of banning such activities (WDFW 1996b). Also, public access restrictions or prohibitions, while not currently in place, are being examined for certain islands that are considered critical wildlife habitats for raptors (WDFW 1996b). Use conflicts with air boats and motorized personal watercraft (also known as jet skis) have led to consideration of a ban on their use at the Wildlife Area (Kraege, personal communication 1997a; WDFW 1996b). Finally, intertidal and estuarine habitat has been affected by extensive diking, which may have altered the function of the delta area and its support of fish and wildlife (Palsson, personal communication 1997).

Nisqually Wildlife Area

Very little information was available concerning the Nisqually Wildlife Area at the time of this study. Although the site has no management plan and is not included on a 1995 WDFW listing of 25 Wildlife Areas (WDFW 1997c), it is part of WDFW Wildlife Area land holdings and includes intertidal area (Schlenker, personal communication 1996). It is assumed the tideland portion of this site functions to some degree as an MPA, at least in that these intertidal areas are set aside and protected from certain development pressures. However, given the lack of additional details, this site is categorized as a Potential/Possible MPA.

WDFW Natural Area Preserves

WDFW owns and manages six Natural Area Preserves (NAPs) throughout Washington State (DNR 1995; Rodrick, personal communication 1997). These NAPs have been established in accordance with protected area goals and objectives of the Natural Area Preserves Act of 1972. NAPs administered by WDFW are registered (in the Washington Register of Natural Area Preserves) and committed through a cooperative agreement with DNR (DNR 1995; RCW 79.70; WAC 332-60-150).

Lummi Island NAP

Of the six WDFW NAPs in the state, one 708 acre site, the Lummi Island NAP, contains a small amount of intertidal area in northern Puget Sound. As such, a brief discussion is presented here on this site and its role as a Marine Habitat/Nature Preserve MPA.

In the early 1990s, the Lummi Island NAP was given high priority by WDFW for acquisition because of the presence of five important habitats (mature forest, rock and gravel beach, cliffs, caves and snag-rich areas) and five protected species (peregrine falcon, bald eagle, marbled murrelet, band-tailed pigeon and pileated woodpecker) (Rodrick and Leschner 1991). Preserve design and management emphasis is directed at the protection of these nesting birds, and not directly at intertidal or subtidal marine resource protection.

The extent of intertidal area within the boundaries of this site is limited to only about 400 linear feet of shoreline below a steep cliff area (Rodrick, personal communication 1997). This intertidal zone is characterized as steep and narrow. The remainder of the approximately 1.5 linear miles of shoreline fronting this predominantly upland NAP is adjacent to public aquatic lands that are under DNR management.

There is currently no management plan for this NAP, and no management planning actions are underway. Supervision by WDFW staff consists of 3 to 4 site visits per year (Rodrick, personal communication 1997). Although NAPs are by design intended to prohibit most public access (excepting approved research or educational activities), this has not been strictly enforced at the Lummi Island site, and low impact local access has been allowed to continue (Rodrick, personal communication 1997). Since its initial designation, the Lummi Island NAP has not yet progressed in the way of site-specific management planning or further program implementation.

It is logical to conclude that Natural Area Preserves, including the Lummi Island site, are not currently a protected area designation tool that WDFW has directed toward the purpose of protecting marine habitat or marine life. The Lummi Island NAP is noted here as a point of reference to assess the extent, however small, that this particular type of WDFW protected area is found within the intertidal area of Puget Sound.

Seabird Sanctuary

The Zella M. Schultz Seabird Sanctuary

Located on 48 acres at the western tip of Protection Island in Jefferson County, the Zella M. Schultz Seabird Sanctuary was originally designated in 1975 by the former Washington Department of Game (now WDFW) as a "Natural Area"[6] — lands of unique character with special wildlife habitat values secured for preservation in their natural state (Hirsh 1981). As an MPA, this study categorizes this site as a Marine Habitat/Nature Preserve.

Protection Island is noted for its high value as wildlife habitat. Seventy two percent of the entire Puget Sound and Strait of Juan de Fuca breeding-age seabird population nest at this small 364 acre island (USFWS 1985). Sand spits at both ends of the island provide important haulout and pupping areas for harbor seals (Hirsh 1981; USFWS 1985).

The Seabird Sanctuary did not always provide the level of protection it does today, and was not originally designated with the intertidal and subtidal buffer area that it now features. The Sanctuary was established for purposes of preserving habitat for the seabirds and other wildlife, and for providing environmental education (Hirsh 1981). Management recommendations were written up for the Sanctuary (Hirsh 1981), but were apparently never fully implemented by the Washington Department of Game. In the early 1980s, studies determined that public use of the beaches and surrounding waters were a primary cause of disturbance to the seabirds and harbor seals of the island (Hirsh 1981).

In 1988, the Protection Island National Wildlife Refuge was established, and DNR withdrew from leasable status the public tidelands and bedlands surrounding the entire island and extending 600 feet offshore from the

line of extreme low tide (DNR 1988c; Edens, personal communication 1997). Although a DNR aquatic lands withdrawal does not preclude all public use, the USFWS management approach for the Refuge, which is closed to the public, has been to post signs discouraging boaters from coming within 200 yards of the island, including the lands still owned by WDFW and designated as the Seabird Sanctuary (Edens, personal communication 1997). The no-access marine buffer area thus provides a level of indirect protection to the marine resources surrounding the island. Management of the site is handled by USFWS and WDFW under a cooperative agreement.

Additional WDFW Wildlife and Habitat Programs and Roles

Other Regulatory Programs

It is important to note that MPAs represent just one marine environmental protection approach and that there are other regulatory programs at WDFW that work to protect fish and wildlife habitat. These include programs and laws associated with Hydraulic Project Approvals, Water Flow policies, Fishway policies and related mitigation sites. These programs are not generally thought of as vehicles for the establishment of permanently protected areas. Instead, these laws protect fish habitat from the potential damages of construction and other development on a project by project basis. It is possible that mitigation sites providing habitat protection in the marine environment could be considered as de facto or temporary MPAs, but lacking comprehensive survey and analysis of these areas precludes such a characterization here. Collectively, these programs are not specifically aimed at proactively identifying and designating discrete areas for long term resource protection, and as such are not treated here as marine protected area programs.

WDFW Advisory Role

It is also important to recognize the role WDFW plays in protecting fish and wildlife habitat through advisory and consultative mechanisms. This involves, but is not limited to, advising city and county governments, DNR and other state agencies, and federal agencies such as the U.S. Forest Service with land use planning and development proposal reviews (Penland 1993). The State Environmental Policy Act (SEPA), the Shoreline Management Act (SMA), and the Growth Management Act (GMA) are state legislative acts that call for WDFW to provide comment and recommendations on environmental documents in the interest of reducing or avoiding impacts of development on fish and wildlife habitat. It has been suggested that this kind of advisory role represents the primary means by which WDFW works to protect wildlife habitat, as the agency has relatively little authority to directly regulate activities affecting the land base (Penland 1993).

The scope of this report does not allow for further discussion of most of the other WDFW approaches. However, two additional WDFW-administered programs closely related to the discussion of MPA approaches. These programs are Game Reserves system and the Priority Habitat and Species Program. Each of these is reviewed briefly below in terms of its potential for, and influence on, MPA establishment.

Game Reserves

Game Reserves are another type wildlife protected area established and managed by WDFW. Under RCW 77.12.040, "Regulating the taking or possessing of game—emergency rules—game reserves, closed areas and waters," Game Reserves could be considered as a mechanism to close an area to the take of game fish. RCW 77.12.040 provides that:

The commission may establish by rule game reserves and closed areas where hunting for wild animals or wild birds may be prohibited and closed waters where fishing for game fish may be prohibited.

However, marine areas closed to the take of game fish are not found at or otherwise associated with any of the state's 30 or so Game Reserves (WAC 232-16), three of which are located along Puget Sound shorelines and include, or may include, intertidal area (see **Table 9**). The only restrictions provided at these three sites is a prohibition on hunting of game animals or game birds, and no guns, traps, or dogs are allowed on game reserves (Kraege, personal communication 1997b). No such restriction has been applied to game fish, and public access to the intertidal portions of these areas is permitted. Game Reserves are thus noted here as a WDFW program element with potential for establishing MPAs.

Table 9. WDFW Game Reserves on Shorelines or with Intertidal Area in Puget Sound

Site Name	Prohibitions
Skagit Delta Game Reserve	Unlawful to hunt game animals or game birds or to trap fur-bearing animals (WAC 232-16-340)
Bayview Game Reserve	Unlawful to hunt wild animals and wild birds (WAC 232-16-690)
Swinomish Spit Game Reserve	Unlawful to hunt wild animals and wild birds (WAC 232-16-700)

Listed Species and the Priority Habitats and Species Program

Several "lists" or categories of important wildlife species and habitat have been developed and are maintained by WDFW. These include protected species (endangered, threatened, sensitive, and certain others) and species of special concern (protected species plus "sensitive" and "monitor" species). These listings provide important guidance for protected area planning, establishment and management by WDFW and other state and local agencies. For example, the WDFW Wildlife Areas and Natural Area Preserve previously discussed can be seen to have a designation justification and management focus that gives primary attention to some of the sites' "listed" species. In consideration of marine protected areas, then, it is important to understand the extent to which marine associated species and habitats are represented on these priority lists.

Appendix C4 provides definitions and brief explanation of the various WDFW-maintained listings, categories and associated terminology.

Priority Species and Habitat Program

WDFW's Priority Habitats and Species (PHS) Program functions as something of an overlay to the above-mentioned species categories. Established in 1989, the purposes of this non-regulatory program are to: define, identify, and map the locations of important wildlife habitats and species using specific criteria; and to develop management recommendations for those habitats and species (Penland 1993).

Priority species are those requiring protective measures for their perpetuation due to population status, sensitivity to habitat alteration, and/or recreational, commercial or tribal importance (WDFW 1996a). Priority species include those that are state-listed as endangered, threatened, sensitive, candidate; animal aggregations considered vulnerable; and those species of recreational, commercial or tribal importance that are also vulnerable (WDFW 1996a). There are currently 147 species and 14 species groups listed as priority species (WDFW 1996a). *Priority habitats* are those habitat types or elements with unique or significant value to a diverse assemblage of species (WDFW 1996a). There are currently 19 priority habitat types identified (WDFW 1996a).

Through the early 1990s, the PHS Program mapped priority species and habitat types on state and private commercial forest land, in urbanizing areas, and in coastal areas vulnerable to oil spills (Penland 1993). Management recommendations are to be developed for these species and habitats. To date, one set of management recommendations has been finalized for invertebrates (WDFW 1995b), with at least five other volumes still in development for such groups as fish, reptiles and amphibians, birds, mammals and habitat (Larsen, personal communication 1997).

PHS Program Marine Species and Habitat Representation

The PHS list includes several marine birds and eight marine mammal species. Marine birds include two endangered species, one threatened species, two candidate species, several species vulnerable in aggregations, as well as several waterfowl classified as game birds and included for their recreational or tribal importance (WDFW 1996a). Of the eight marine mammals on the PHS list, two are listed because of their state endangered status, one for its threatened status, one candidate species, and the remaining for their vulnerability in aggregations (such as haulout areas) (WDFW 1996a).

Beginning with the 1996 edition of the Priority Habitats and Species List, food fish, shellfish and a few new marine habitats were added to the list (WDFW 1996a). Prior to this, the list included few species under the jurisdiction of the former Washington Department of Fisheries (WDFW 1996a). The recent change added thirty-two food fish and shellfish species to the PHS list (WDFW 1996a). **Table 10** lists the shellfish and food fish species, as well game fish, included on the PHS list. All of these fish and shellfish species are on the PHS list because of either aggregations of populations considered to be vulnerable, or because of their recreational or tribal importance. None of these species are listed as endangered, threatened, sensitive or candidate.

PHS listed marine habitats are described as: 1) consolidated marine/estuarine shorelines (such as rocky outcroppings); 2) estuary/estuary-like; 3) unconsolidated marine/estuarine shorelines (such as mud flats); and 4) vegetated marine/estuarine (including eelgrass meadows, kelp beds and turf algae). Of these, new to the list are unconsolidated marine/estuarine shorelines and the inclusion of turf algae as part of vegetated marine/estuarine habitat.

MPA Implications of Listed Species and the PHS Program

The designation of listed species has been, and will continue to be, a high priority factor for the acquisition and management of WDFW protected areas in Puget Sound. These listed species also guide WDFW in its advisory role to other agencies and local governments concerning land use decisions and habitat protection.

It remains to be seen to what extent MPA development might be influenced by the recent move to incorporate food fish, shellfish and marine habitats into the PHS program. Such a listing program was not to be found in the former Department of Fisheries. As part of the PHS list, these resources, at a minimum, should receive heightened management attention, resulting in updated maps and greater data availability, and the development of management recommendations (Larsen, personal communication 1997). Ideally, acknowledgment of these PHS-listed marine species and habitats by WDFW and other agencies and governments is expected to influence land use planning decisions that foster protection and preservation of these resources (Larsen, personal communication 1997).

Table 10. Marine Invertebrates and Marine and Anadromous Fish Species on the WDFW Priority Habitats and Species List[1]

Common Name	Species Criteria (1,2, or 3)	State status	Common Name	Species Criteria (1,2, or 3)	State status
MARINE INVERTEBRATE SPECIES			Chinook salmon	2,3	Food fish
Pinto abalone	2,3	Shellfish	Chum salmon	2,3	Food fish
Geoduck	3	Shellfish	Coastal resident/Searun cutthroat	3	Game
Butter clam	2,3	Shellfish	Coho salmon	2,3	Food fish
Littleneck clam	2,3	Shellfish	Pink salmon	2,3	Game
Japanese littleneck clam	2,3	Shellfish	Rainbow trout/Steelhead	3	Game
Olympia oyster	2,3	Shellfish	Sockeye salmon	2,3	Food fish
Pacific oyster	3	Shellfish	Pacific cod	2,3	Food fish
Razor clam	3	Shellfish	Pacific whiting	2,3	Food fish
Dungeness crab	2,3	Shellfish	Black rockfish	2,3	Food fish
Pandalid Shrimp	3	Shellfish	Copper rockfish	2,3	Food fish
Red urchin	3	Shellfish	Quillback rockfish	2,3	Food fish
MARINE AND ANADROMOUS FISH SPECIES			Yelloweye rockfish	2,3	Food fish
Green sturgeon	2,3	Food fish	Lingcod	2,3	Food fish
White sturgeon	2,3	Food fish	Largemouth bass	3	Game
Pacific herring	2,3	Food fish	Walleye	3	Game
Eulachon	2,3	Food fish	Pacific sand lance	2,3	Food fish
Longfin smelt	3	Food fish	English sole	3	Food fish
Surfsmelt	2,3	Food fish	Rock sole	3	Food fish
Bull trout/ Dolly Varden	2,3	Game			

1. It should be noted that the 1996 PHS list also includes marine birds and marine mammals. This includes five individual marine bird species; concentrations of several marine bird species; several other marine-associated birds such as herons, waterfowl, shorebirds and raptors; and 8 species of marine mammals.
2. Species criteria codes:
   1 = State listed (endangered, threatened, sensitive) and Candidate species;
   2 = Vulnerable aggregations. Includes those species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to aggregate.
   3 = Species of recreational, commercial and/or tribal importance.

Note that there are no criteria 1 species for the fish and marine invertebrates listed on this table.

Source: Derived from: Washington Department of Fish and Wildlife, Priority Habitats and Species List, January 1996

Wildlife and Habitat Summary Remarks

The Wildlife Code mandates WDFW to establish "policies to preserve, protect, and perpetuate wildlife, fish, and wildlife and fish habitat" so as to "maximize fishing, hunting, and outdoor recreational opportunities compatible with healthy and diverse fish and wildlife populations" (RCW 77.04.055[1]). The Washington Fish and Wildlife Commission's wildlife and habitat goals related to "area" protection reflect WDFW efforts to acquire, maintain and enhance habitats for natural ecosystems, priority habitats and for providing wildlife- and fish-related recreational opportunities.

In terms of established MPAs, this section has identified four existing and one potential Puget Sound WDFW-designated sites under the administration of wildlife programs (Table 8).
Of particular interest among Wildlife Areas, the South Puget Sound Wildlife Area operates under a non-consumptive use policy and WDFW-owned tidelands are being considered as a no-harvest management zone (Kessler, personal communication 1997). Other existing MPAs differ in a number of basic ways, with one site featuring a very small intertidal component (Lummi Island Natural Area Preserve), and another managed under policies supportive of consumptive uses such as fishing and shellfishing (Skagit Wildlife Area).

Other WDFW programs and laws, such as game reserves, fishway and water flow policies and hydraulic project approval laws, provide wildlife and habitat protection but are not directly associated with MPA establishment. However, the recent addition of select food fish, shellfish and marine habitats to the Priority Habitats and Species (PHS) list offers possibilities for influencing future decisions regarding MPA establishment and management.

WDFW Conclusion

The role of the Washington Department of Fish and Wildlife is far reaching with respect to marine protected areas. For simplicity, and to reflect the designation history of most WDFW MPAs, the discussion of this agency's laws, programs and MPAs has been organized along the same jurisdictional lines that until recently separated the former Departments of Fisheries and Wildlife.

With regard to fisheries management, WDFW can be seen as playing a crucial role in MPA development. Several MPAs throughout Puget Sound — established and managed through the efforts of local communities, governments or other institutions — benefit from, and in most cases could not exist without, harvest closure rules adopted by WDFW. WDFW's unprecedented twenty-four Puget Sound no-take MPA proposals received in 1997, many from groups outside the agency, attest to this important role. Such regulatory authority and actions are essential to the development of subtidal MPAs offering higher levels of resource protection.

Ten existing MPA sites (categorized in this study as one Multiple Use Protected Area, two Recreational Marine Preserves, five Research and Educational Marine Preserve sites, and two Marine Species Preserve sites) feature year-round harvest closures that were established by WDFW. Primary management of several of these MPAs is handled by entities other than WDFW.

Among WDFW land areas managed for wildlife and habitat protection and preservation, four existing designated protected areas include intertidal components and are identified in this study as MPAs. Of these, one is classified as a Multiple Use Protected Area (Skagit Wildlife Area) and three as Marine Habitat/Nature Preserves (South Puget Sound Wildlife Area, Zella M. Schultz Seabird Sanctuary and Lummi Island NAP). None of these land-based sites contain subtidal area within their boundaries (although the Zella M. Schultz Seabird Sanctuary is surrounded by a marine buffer area withdrawn from leasable status by DNR), and none contain fishing restrictions established by laws of WDFW's fisheries code (RCW Title 75). Other wildlife or habitat oriented WDFW-administered laws and programs mentioned were noted as being either supportive or somewhat related to MPAs (e.g., Priority Habitats and Species Program, Hydraulic Project Approvals, Water Flow policies, Fishway policies and mitigation sites), or holding MPA establishment potential (e.g., Game Reserves).

Overall, the Washington Department of Fish and Wildlife has been, and will continue to be, a key institution for MPA development.

4.1.3 State Parks and Recreation Commission

The Washington State Parks and Recreation Commission (WSP&RC) operates more than 105 state parks across the state, as well as other land holdings, totaling over 232,000 acres (WSP&RC 1988). WSP&RC is responsible for the care, charge, control, and supervision of these park areas, and is empowered to adopt and enforce rules necessary to carry out these responsibilities (RCW 43.51.040).

After a brief discussion of state park areas and the extent and type of state parks containing intertidal or subtidal components in Puget Sound, this section will discuss WSP&RC's role, both current and potential, in marine

protected area establishment. Applicable to intertidal holdings at state park areas, WSP&RC's system-wide prohibition on the collection of unclassified marine invertebrates and prohibitions on algae harvest provide the basis on which this study identifies 60 developed state parks as existing MPAs. Beyond this, consideration of WSP&RC's potential involvement in MPA establishment and management takes into account the agency's authority to prohibit fishing at state park areas, recent developments in comprehensive park management planning, and their administrative responsibility for a reforming underwater parks program.

State Park Areas

State park areas are described in the Washington Administrative Code as "areas are of state-wide natural, cultural and/or recreational significance and/or scenic beauty" (WAC 352-16-020). The state legislature has declared that it is the continuing policy of the state to set aside and manage certain lands for public park purposes, and that such lands shall be acquired and managed to (RCW 43.51.395):

(1) Maintain and enhance ecological, aesthetic, and recreational purposes;
(2) Preserve and maintain mature and old-growth forests containing trees of over ninety years and other unusual ecosystems as natural forests or natural areas, which may also be used for interpretive purposes;
(3) Protect cultural and historical resources, locations, and artifacts, which may also be used for interpretive purposes;
(4) Provide a variety of recreational opportunities to the public, including but not limited to use of developed recreation areas, trails, and natural areas;
(5) Preserve and maintain habitat which will protect and promote endangered, threatened, and sensitive plants, and endangered, threatened, and sensitive animal species; and
(6) Encourage public participation in the formulation and implementation of park policies and programs. [1984 c 82 § 2.]

State Park Land Classifications

There are six land classifications established for state parks that are defined, in a general sense, by the extent and type of public recreational use deemed appropriate for each (WAC 352-16-020) (**Table 11**). An understanding of these categories assists in characterizing state park areas as existing or Potential/Possible Marine Protected Areas.

At the "stricter" end of the scale, Natural Areas, Heritage Areas, Natural Forest Areas and Natural Area Preserves are among those classifications for which management policy is directed toward protection and preservation of specific features. Of these, only Natural Area Preserves (as previously discussed and defined in Section 4.1.1 on DNR) have been categorically considered by WSP&RC as areas where the harvest of fish, shellfish and algae is prohibited (WSP&RC 1996d) (**Table 11**). However, there are no Natural Area Preserves yet established by WSP&RC at any of the state park areas in Puget Sound. Further details on WSP&RC fishing rules and policies will be discussed at forthcoming point in this section.

Puget Sound State Park Areas

The significance of WSP&RC's role in marine area protection is made apparent, in part, through consideration of the extensive shoreline and intertidal area under the agency's management. A review of WSP&RC's 1995-97 Biennium Areas Reports (WSP&RC 1996a) and other WSP&RC records indicates that there are approximately 97 state park areas (60 designated and developed state parks plus an estimated 37 undeveloped properties) located along shores and encompassing tidelands in Puget Sound. These areas contain intertidal and in some cases a small amount of subtidal area.

This study characterizes the 60 designated state park areas as Multiple Use Protected Areas. These mostly land-based parks comprise over 20,000 acres and stretch along approximately 93 miles of saltwater shoreline. Almost all of the tidelands adjacent to these state parks are included within the parks' bounds or are otherwise administered by WSP&RC. **Appendix C5** lists each of these state park areas, as well as undeveloped sites, and provides information on park size, shoreline length, and tidelands.

Undeveloped state park areas do not contain public facilities. These areas have usually not undergone management planning and are often without designated WSP&RC land use classification (Castor, personal communication 1997). In many cases, undeveloped state park properties are being held for future WSP&RC evaluation and possible park area development. These undeveloped areas are excluded from the list of existing MPAs identified in this study, yet recognized as potential future MPAs.

Table 11. Land Use Classifications and Fishing-related Compatibility Determinations for Washington State Park Areas

Classification	Definition (per WAC 352-16-020)	Comments on Philosophy	Use Compatibility[1] for Harvest of:		
			Fish[2]	Shellfish[2]	Algae[3]
Recreational Areas	Suited and/or developed for high-intensity outdoor recreational use, conference, cultural and/or educational centers, or other uses serving large numbers of people.	Primary emphasis on provision of quality recreation for large numbers with secondary recognition given to protection of natural qualities.	P	P	P
Resource Recreation Areas	Suited and/or developed for natural and/or cultural resource-based medium-intensity and low-intensity outdoor recreational use.	Management focus on preserving quality of natural and cultural resources that is the lure for human recreation while allowing appropriate levels use.	P	P	P
Natural Areas	Designated for preservation, restoration, and interpretation of natural processes and/or features of significant ecological, geological or paleontological value while providing for low- intensity outdoor recreational use.	Addresses the human need for readily available "conservatories" of nature & open spaces. Secondary consideration for opportunities other than naturally existing educational & recreational.	P	P	P
Heritage Areas	Designated for preservation, restoration, and interpretation of unique or unusual archaeological, historical, scientific, and/or cultural features, and traditional cultural properties, which are of state-wide or national significance.	Designated to preserve and/or interpret selected areas or features for the education and enjoyment of the public, an area's intrinsic cultural value, and/or for scientific research.	P	P	P
Natural Forest Areas	Designated for preservation, restoration, and interpretation of natural forest processes while providing for low-intensity outdoor recreation activities as subordinate uses.	Access limited to activities that do not significantly degrade natural forest processes.	P	P	P
Natural Area Preserves	Designated for preservation of rare or vanishing flora, fauna, geological, natural historical or similar features of scientific or educational and which are registered and committed as a natural area preserve through a cooperative agreement with an appropriate natural resource agency pursuant to chapter 79.70 RCW & chapter 332-60 WAC.	Sites where human access is limited to educational and scientific purposes. Principal function is to preserve natural ecosystems or geologic features of statewide significance. Public access for recreation must be subordinate to this principal function	N	N	N

1. Explanation of use compatibility codes:
   P (Permitted) - Use permitted with normal agency design review.
   C (Conditional) - Use may be permitted, but conditioned to assure design is compatible with purpose of land classification.
   N (Not Permitted) - Use not permitted.
2. Note also that WSP&RC fishing rules are found at WAC 352-32-150, and provide that only fish classified as game fish, food fish and shellfish may be removed from state park areas.
3. Note that 1996 WSP&RC-adopted policy prohibits algae harvest at all park areas except Fort Ebey, Fort Flagler and Fort Worden.

Source: Washington State Parks & Recreation Commission (WSP&RC). 1996d.
Template State Park Management Plan, Draft, 6 November

Included within the 60 designated and developed state park areas is a fairly extensive marine park system extending throughout the waters of Puget Sound, the Strait of Juan de Fuca and the San Juan Islands. As shown in **Appendix C6**, marine state parks accommodate recreational boaters with 265 mooring buoys, 9000 feet of float space, boat launches and sewage pump-out stations at 41 sites throughout Puget Sound (WSP&RC 1995c).

WSP&RC-designated underwater parks and artificial reefs have been designated at some 13 sites throughout Puget Sound (**Table 13**). These areas and the implementation status of a WSP&RC-administered underwater parks program will be discussed later in this section.

State Parks as MPAs

In considering the current and potential role WSP&RC plays with regard to MPAs, this section discusses the following three aspects of WSP&RC policy: 1) the authority to establish fishing closures and the implementation of algae harvest restrictions at park areas; 2) new comprehensive state park planning developments; and 3) underwater parks.

This study's characterization of intertidal and subtidal state park areas as existing MPAs is generally associated with their role in the setting aside and management of marine environments for public use, while preserving natural features and resources at these sites. As such, this study categorizes intertidal and marine state park areas as Multiple Use Protected Areas.

Fishing and Algae Harvest Restrictions

WSP&RC Authority to Prohibit Fishing in State Park Areas

WSP&RC has clear authority to restrict fishing activities at state park areas. Under statute at RCW 43.51.180(3), the taking of any fish[7] from the waters of any park or parkway is prohibited, except if done in conformity with such rules as the Commission may prescribe. This statutory authority is also clearly acknowledged in administrative law at WAC 352-32-150(4), which states that:

The commission may, after consultation with the state department of fish and wildlife and local tribes, close state park areas to the harvest of some or all species of fish. Such state park areas shall be conspicuously posted as closed to harvest.

The general fishing policy adopted by WSP&RC, and set in administrative law, closes all state park areas to the take of unclassified species. Specifically, WAC 352-32-150 states that:

...(3) No person shall remove or cause to be removed any fish from any state park area except for food fish as defined by WAC 220-12-010 , shellfish as defined by WAC 220-12-020 , and game fish as defined by RCW 77.08.020 and WAC 232-12-019.

In practice, this essentially translates to, and has been described as, a WSP&RC system-wide prohibition on the take of unclassified marine invertebrates (Hovis, personal communication 1997), such as sea stars, sand dollars and other intertidal organisms. The removal of these unclassified marine invertebrates from popularly visited beaches and intertidal areas, such as can be found at many shoreline state parks, has been noted as a problem throughout Puget Sound (Kyte 1989; Carney and Kvitek 1991). However, in certain areas, such as the San Juan Islands, enforcement of this "fishing" rule is not a practical management priority for WSP&RC (Castor, personal communication 1997).

WSP&RC is the only state agency that has taken action to systematically protect both algae (to be discussed) and unclassified marine invertebrates from harvest. No other state agency or jurisdiction has made an attempt to implement a system-wide protection of these marine resources. As previously mentioned, it is this legal protection of unclassified marine invertebrates and algae that provides the basis for this study's inclusion of the 60 developed state parks in Puget Sound as existing MPAs.

Concerning the possibility of WSP&RC to restrict harvest of fished species at state park areas, it is important to note certain jurisdictional limitations. WSP&RC's fishing regulatory authority is limited to an ability to either allow or not allow fishing, and not to regulate quantity or time of harvest. The authority to regulate quantity and time of harvest rests solely with WDFW. In addition, WSP&RC has no authority over lands for which it has no management responsibilities. At many of the 60 developed state parks identified in this report, the adjacent subtidal bedlands are not under WSP&RC management. A shift in management responsibilities to WSP&RC from DNR is theoretically possible under various means, such as aquatic land agreements or withdrawals (as discussed at Section 4.1.1), but few such transactions have been effected in the last ten years (Regan, personal communication 1997).

State Parks' Algae Harvest Policy

Harvest of algae for food has been observed to be a common activity at many Washington State beaches, including state park areas (WSP&RC 1995b). In a 1995 report to the Commission, WSP&RC staff reported that algae harvest activities at state parks were causing management problems and raising concerns about threats to the algae resource (WSP&RC 1995b). The report acknowledged the vital importance of marine algae in its natural state to the health of the nearshore marine environment, as well as the importance of algae harvest for many people as a cultural, recreational and sustenance activity (WSP&RC 1995b). The WSP&RC report also noted that harvest activities seemed to be increasing in recent years, that current staffing levels did not allow sufficient time to enforce existing regulations (a 10 wet pound per person daily limit) and that some harvesting techniques were known to be damaging to algal populations (WSP&RC 1995b). Concern was expressed that harvesting was allowed to continue at state parks despite a lack of biological and harvest data (WSP&RC 1995b), and staff informed the Commission they would report back when more information was available (Regan, personal communication 1997).

A subsequent 1995 study of algae harvest at seven state parks reported many users harvesting well over the 10 pound daily limit, harvesting without a license, and engaged in damaging harvesting practices (WSP&RC 1996b). This led to the recommendation that algae harvest at state parks be closed until further notice (WSP&RC 1996b). The recommendation was approved by the Commission in 1996 and a policy went into effect for all but three Washington state parks (Fort Ebey, Fort Flagler and Fort Worden) prohibiting all harvesting of algae until further notice (WSP&RC 1996b; Hovis, personal communication 1997). Since that time, however, Fort Warden State Park has also been closed to algae harvest by WSP&RC action to allow for a biological study (Regan, personal communication 1997).

It is thus observed that WSP&RC has the legal authority to protect (prohibit the take of) fish, shellfish and marine vegetation at State Park areas, and under this authority WSP&RC has taken action to protect unclassified marine invertebrates and algae resources. While fishing for food fish, shellfish and game fish is allowed at State Parks, algae harvest has been almost completely prohibited.

New Park Management Planning and MPA Potential

State Parks Planning Background

Historically, Washington state park management has been characterized as somewhat centralized in nature (Farber, personal communication 1996). Individual park management plans did not exist, and for the most part remain undeveloped for the vast majority of state parks. Individual park resource decisions were thus made on a case by case basis by review through the agency hierarchy (Regan, personal communication 1997).

In 1992, WSP&RC adopted a Strategic and Action Plan that, among other things, called for the agency to prepare management plans for each park in the system. This call to action was brought about in response to the growing challenge of accommodating increasing demands for recreational opportunities while protecting sensitive natural and cultural resources (WSP&RC 1996d). By 1994, a model plan was developed to guide these planning efforts. In 1996, building on the Commission's adoption of a revised land classification system (as previously discussed — see **Table 11**), a combined approach was initiated through the Classification And Management Planning (CAMP) project (WSP&RC 1996d).

Current Status of Park Planning and Attention to Marine Resources

WSP&RC intends to produce management plans for 10 to 15 parks over the next two years, including many in the San Juan Marine Area and Deception Pass State Park (Farber, personal communication 1996). With development of these plans, consideration will be given to the resource protection needs of marine environments within and adjacent to parks. For example, intertidal classification and management is a part of this process. Additionally, WSP&RC is looking to develop an interagency approach to management of bedlands and the water column adjacent to park areas to direct recreational uses and protect environmentally sensitive areas (Regan, personal communication 1997). These efforts suggest the potential for MPA development.

A WSP&RC Resource Management Planning Example: Lime Kiln Point State Park

Recent developments at Lime Kiln Point State Park provide an example of WSP&RC resource management planning with a particular focus on protection of rocky intertidal environment. The 39 acre park (Regan, personal communication 1997) is located on the west side of San Juan Island, and contains over 2000 feet of rocky shores characterized as a species rich and physically diverse intertidal environment (WSP&RC 1996c). The park receives heavy use in summer months by visitors watching whales from shore. Emerging issues of concern include (but are not limited to) trampling of intertidal organisms, harvesting and collection of nearshore marine life and burning or collection of driftwood (WSP&RC 1996c).

A Limits of Acceptable Change (LAC) management model was applied in the development of a resource management plan for Lime Kiln Point State Park. The LAC model involves the identification, inventory and monitoring of natural resource indicators and standards as a basis for establishing and evaluating management actions. At Lime Kiln Point State Park, a comprehensive marine survey and the development of management recommendations was completed for WSP&RC in 1995 (Brosnan et al. 1995), and findings have been incorporated into the park's recently adopted resource management plan (Regan, personal communication 1997).

Through application of the LAC model to the park's intertidal management zone, intertidal resource standards and associated monitoring techniques have been developed. A series of management options, ranging from least intrusive for park users to most restrictive, are aimed at addressing problems associated with indicator thresholds being exceeded. For the intertidal management zone, these options, in order of preferred implemen-

tation, are: 1) educational strategies; 2) rerouting of trails; 3) enforcement and/or enactment of rules; and 4) access restrictions such as zoning (WSP&RC 1996c).

WSP&RC Underwater Parks

Some ten underwater state park areas are treated in this study as Potential/Possible rather than existing MPAs. They were established by WSP&RC throughout Puget Sound in the early 1970s through a capital development program. Initial implementation of the program resulted in bedland withdrawal from DNR to WSP&RC in favor of recreational use, preventing conflicting uses from occurring without WSP&RC consent. It also allowed for the placement of underwater structures, and upland support facilities (Regan, personal communication 1997). Presented here is a brief discussion of the underwater parks, the program intended to administer them, and the MPA potential of WSP&RC-designated underwater park areas.

History of WSP&RC Underwater Parks

WSP&RC initiated an underwater park program in 1969 in response to requests for establishment of such a program by the Washington Council on Skin Diving Clubs (WSP&RC 1994; 1997). One of the original concepts behind WSP&RC's development of this program, as expressed by WSP&RC staff to the Commission, was that "there should be places in the State of Washington to preserve the underwater marine life and where hunting is illegal" (WSP&RC 1994).
By 1970, WSP&RC identified six locations adjacent to existing upland parks for inclusion within the State Parks system. By 1971, these six sites, and an additional four, were designated as recreational areas and natural areas (see sites 1-10 at **Table 12**). It was noted at the time that the primary purpose of the action would be for protection of the resources (WSP&RC 1994).

A WSP&RC program for the establishment of artificial reefs was also introduced in 1971 (WSP&RC 1994). Under this program, artificial reefs were to be placed with "surplus wooden barges suitably modified, sunk and marked for sport diving purposes" (WSP&RC 1994). In addition to the six underwater recreation areas at which man-made structures were placed (see **Table 12),** artificial reefs were also placed at an additional three known areas in Puget Sound (see sites 11-13 at **Table 12**). The wooden barges placed at many of the artificial reef sites had almost completely deteriorated and disappeared by the early 1990s (Larson 1997b).

In the following years additional WSP&RC research and data collection led to the publishing of a 1977 Underwater Parks Comprehensive Study (WSP&RC 1977). This report, which predated and is now superseded by CAMP (Regan, personal communication 1997), included recommendations for four new underwater park classifications: underwater recreation areas, underwater natural areas, underwater heritage areas and underwater conservation areas. Underwater natural areas were defined as "bedlands and surrounding marine areas that contain scenic beauty and/or unique features in an unspoiled natural condition... free of foreign objects placed there by man so that only indigenous plants and animals may be viewed in an underwater natural area" (WSP&RC 1977; WSA 1993). Among these four categories, it is noteworthy here that for underwater natural areas it was recommended that fishing and other harvesting, artifact removal, dredging and any kind of construction be prohibited (WSP&RC 1977; WSA 1993).

In the years following this study, WSP&RC was not able to further develop underwater parks due largely to funding constraints. Knowledge of underwater areas grew, especially regarding artificial reefs (WSP&RC 1994). WDFW has developed stringent criteria for the design of artificial reefs that require justification for both biological and fishery management purposes (WSP&RC 1994; Regan, personal communication 1997). WSP&RC has acknowledged that substantial research within the Puget Sound ecosystem will be necessary prior to engaging in construction of any additional artificial reefs or underwater park development (WSP&RC 1994; Regan, personal communication 1997).

After years of languishing since the initial site designations in the early 1970s, the underwater parks program received something of a boost in 1993. The state legislature, spurred by efforts of the Washington Scuba Alliance (WSA) and state Senators Bob Oke and James West, enacted legislation that directed WSP&RC to "act as the lead agency for establishing underwater parks in state waters" (RCW 43.51.430; WSP&RC 1994).

Table 12. Underwater Park and Artificial Reef Areas Designated by the Washington State Parks and Recreation Commission

#	Underwater Park or Artificial Reef Name	WSP&RC Classification or type	Date of Designation	Notes
1	Deception Pass	Natural Area	1970	
2	Peapod Rocks	Natural Area	1970	Now managed by U.S. Fish and Wildlife Service as part of the San Juan Islands National Wildlife Refuge
3	Fort Casey	Recreation Area	1970	Artificial reef. Rock breakwater for ferry.
4	Fort Ward	Recreation Area	1970	
5	Blake Island	Recreation Area	1970	Artificial reef installed later; broken concrete rubble.
6	Saltwater	Recreation Area	1970	Artificial reef installed later; wooden barge (gone by early 1990s) and tires.
7	Seahurst	Recreation Area	1971	No longer State Park area; King County Park Cooperative
8	Tolmie	Recreation Area	1971	Artificial reef. Formerly Jones Beach.
9	Kopachuck	Recreation Area	1971	Artificial reef located off Kopachuck State Park. Wooden barge (gone by early 1990s)
10	Deadmans Island (Cutts Island)	Recreation Area	1971	Artificial reef. Formerly Cutts Island. Located off Kopachuck State Park. Wooden barge (gone by early 1990s)
11	Sucia Island (Ewing Cove)	Artificial Reef	1971-1977?	Artificial reef. Placement of small sunken vessel
12	Fort Worden	Artificial Reef	1971-1977?	Artificial reef. Placement of tires, barge & concrete
13	Fort Flagler	Artificial Reef	1971-1977?	Artificial reef. Placement of concrete debris

Sources: Washington State Parks and Recreation Commission (WSP&RC). 1977. Underwater Parks Comprehensive Study. Washington State Parks and Recreation Commission, Olympia, WA..

Washington State Parks and Recreation Commission (WSP&RC). 1994. F-3 - Washington Scuba Alliance (WSA) adopts underwater parks - Report. Report to the Washington State Parks and Recreation Commission from C. Pinnix, Director, State Parks and Recreation Commission. Prepared by L. Fairleigh, Assistant Director, Resources Development Director, WSP&RC. September 9, 1994. 7 pp.

Larson, Don. 1997. President, Kitsap Diving Association. Personal communication, 16 December.

According to RCW 43.51.430 through 43.51.438, underwater parks are to "provide for diverse recreational diving opportunities and to conserve and protect unique marine resources of the state of Washington." The law is permissive in nature, stating at RCW 43.51.432 that WSP&RC *may* take the following actions:

(1) Plan, construct, and maintain underwater parks;
(2) Acquire property and enter management agreements with other units of state government for the management of lands, tidelands, and bedlands as underwater parks;
(3) Construct artificial reefs and other underwater features to enhance marine life and recreational uses of an underwater park;
(4) Accept gifts and donations for the benefit of underwater parks;
(5) Facilitate private efforts to construct artificial reefs and underwater parks;
(6) Work with the federal government, local governments and other appropriate agencies of state government, including but not limited to: The Department of Natural Resources, the Department of Fish and Wildlife and the Natural Heritage Council to carry out the purposes of RCW 43.51.430 through 43.51.438; and
(7) Contract with other state agencies or local governments for the management of an underwater park unit.

Current Status of WSP&RC Underwater Parks

Very few improvements have occurred since the legislature initially funded an underwater parks capital development program. However, the initial investment funded underwater structures and support facilities at ten parks. State park areas are identified in most independent dive site guides published for the Puget Sound area, but very few of the underwater parks are described in detail at the site. Also, although initial classification set harvest restriction zones at some underwater parks, subtidal harvest restriction areas are not patrolled at the two underwater natural areas located at Deception Pass and Peapod Rocks (Regan, personal communication 1997). Additional progress has been made in recent years to raise awareness of the state's underwater parks and toward exploring options to get the program officially implemented.

With financial and other assistance from WSP&RC, Key Bank of Washington, PADI, Project AWARE Foundation, PADI Foundation of California and Puget Soundkeeper Alliance, the Kitsap Diving Association and Washington Scuba Alliance (WSA) led efforts to install a variety of marine life and scuba diving interpretive signs at 30 locations in Puget Sound. Areas of installation included state parks near underwater parks and other popular diving areas (Larson, personal communication 1997). WSA is a non-profit organization that was formed in 1992 to promote the underwater environment of Washington State (WSA 1997). The project, known as "Educational Signs to Identify Underwater Parks and Marine Life in Puget Sound," was initiated in 1994 and completed by 1996 (WSA 1997). These generic interpretive signs do not specifically identify areas as WSP&RC-designated underwater parks, nor do they post any rules regarding marine life harvest restrictions.

Other recent developments related to underwater parks include unofficial site adoptions by diving groups. At least three state parks with underwater parks (Saltwater, Blake Island, and Fort Casey), as well as three or more other state park areas (Illahee, Fay Bainbridge, and Turn Island) have been unofficially "adopted" by various diving clubs, organizations and shops (WSP&RC 1994). Diver activities at these sites vary, but generally have included surveys, mapping, cleanup and planning efforts for further enhancements and development (WSP&RC 1994; WSA 1997).

Most recently, in 1997, the state legislature appropriated $250,000 through WSP&RC's operating budget solely for the development of underwater park programs and facilities (SHB 2259, section 302). This appropriation had the backing and support of State Senators Bob Oke and James West, and received broader support from dive groups such as WSA and others. With the approved two year funding (July 1997 to June 1999), WSP&RC has so far assembled a task force of divers and other interested parties to provide guidance and take the following steps: 1) confirm and complete an understanding of specific diver interests in underwater park facilities and services; 2) identify "first priority" facilities and services; and 3) develop a financial plan to support an underwater parks program (WSA 1997).

Through meetings of the task force, which began in March 1997, a number of major issues have been identified which need to be considered and acted upon to rejuvenate the underwater parks program. Of particular relevance to MPAs, there has been consideration of regulations that might be necessary to help operate underwater parks safely and for conservation of resources. According to an October 1997 progress report, setting underwater parks aside as "sanctuaries" received a great deal of support from the task force (WSP&RC 1997). However, the issue has not been addressed specifically, and the task force plans to deal with such considerations on a site-by-site basis. WSP&RC will work closely with other involved agencies, such as DNR and WDFW (WSP&RC 1997).

MPA Potential of WSP&RC Underwater Parks

Clearly, the concept and framework originally adopted for underwater parks, and especially for underwater natural areas, provides a protective structure that is befitting of a subtidal MPA. The regulatory authority provided WSP&RC with respect to resource protection (including some authority over fishing) also serves to reinforce the potential for more protective state park area designations at underwater parks. As the task force considers the need for restricting fishing activities at underwater parks, and as WSP&RC works with other agencies on the matter, the potential for MPA designations exists.

Washington State Parks and Recreation Commission — Summary Remarks

This study characterizes 60 developed state park areas in Puget Sound as Multiple Use Protected Areas. These mostly land-based parks comprise over 20,000 acres and stretch along approximately 93 miles of saltwater shoreline, including extensive tidelands. WSP&RC's system-wide prohibition on the collection of unclassified marine invertebrates and prohibitions on algae harvest provide the basis on which this study identifies 60 developed state parks as existing MPAs.

Consideration of WSP&RC's possible involvement in additional MPA establishment takes into account a number of factors and new developments. This potential is represented in a variety of ways: WSP&RC's clear authority to restrict fishing activities at state park areas; the non-consumptive (no fishing/shellfishing) management policy associated with WSP&RC-established NAPs (although none exist yet in marine waters); the comprehensive park management planning underway and the attention to park area marine environments it will bring; and the marine resource protection possibilities of the developing underwater park program. The combination of these elements suggests that WSP&RC is and will be an important agency where MPA establishment and management are concerned.

4.1.4 Washington State Department of Ecology

The Washington State Department of Ecology (Ecology) is the primary environmental agency for management, protection and enhancement of the state's air, land and water resources (PSWQA 1990). Established in 1970, Ecology's mission is to protect, preserve and enhance Washington's environment, and promote the wise management of our air, land and water for the benefit of current and future generations (Ecology 1996a).

Ecology is responsible for and involved in the administration and delivery of a wide variety of environmental programs and services, including (but not limited to): permit and authorization programs for waste water discharge, water rights and hazardous waste permits; air and water quality monitoring; toxic waste site cleanup; federal consistency review of state laws and regulations; review of local government permitting actions related to shorelands and solid waste disposal; financial assistance for environmental protection projects through grant and loan programs to local governments and tribes; and technical assistance on pollution control or resource development issues to citizens, local government and industries (Ecology 1996b).

Ecology administers a number of laws that are directly or indirectly related to the protection of marine resources, including water quality and aquatic habitat. Among these, Ecology administers state responsibilities of the federal Clean Water Act and the Coastal Zone Management Act (CZMA). Ecology also coordinates the permitting process of the State Environmental Policy Act (SEPA), and administers the state's Shoreline Management Act and the Ocean Resources Management Act (ORMA). Concerning water quality and surface water flow, Ecology administers the Water Pollution Control Act, State Water Quality Standards, the Water Resources Act, the Minimum Water Flows and Levels Act and the Surface Water Code (PSWQA 1990).

Limits of Ecology Review

There are many laws and programs administered by Ecology (as previously mentioned) that, while not directly involving the proactive establishment of protected areas in the marine environment, play an important role in the control of pollution impacts on marine resources and help prevent marine habitat loss and degradation. It is beyond the scope of this review to discuss or mention all such Ecology programs and laws. However, Condello (unpublished, 1996) provides a recent and comprehensive legal overview of Ecology's larger role in marine area protection and management.

For purposes of this study, the discussion of Ecology's direct involvement with established MPAs will primarily focus on the agency's operation of the Padilla Bay National Estuarine Research Reserve. Brief discussion will also be presented on the Shoreline Management Act (SMA), its potential for MPA establishment, and Ecology's role as administrator of the this Act. Concerning proposed MPAs, Ecology has also assisted the National Oceanic and Atmospheric Administration (NOAA) in a feasibility study for the proposed Northwest Straits National Marine Sanctuary, which is discussed at Section 4.2.

Ecology and MPAs

Padilla Bay National Estuarine Research Reserve

The Padilla Bay National Estuarine Research Reserve, administered and operated by Ecology, was designated in 1980 by NOAA and Washington State under the Coastal Zone Management Act (CZMA). The site is located in Skagit County and includes some 11,000 acres (including approximately 2000 subtidal acres) of mostly tidelands, featuring extensive eelgrass meadows, mudflats, channels, subtidal habitat and fringing salt marshes (NOAA 1996b; Stevens 1997a, in MPA Survey 1996).

The National Estuarine Research Reserve System

The National Estuarine Research Reserve (NERR) System, administered by NOAA's Sanctuaries and Reserves Division and created in 1972 with passage of the Coastal Zone Management Act, consists of a national network of estuarine protected areas established through federal-state partnerships. There are 22 estuarine reserves designated as of 1996, with Padilla Bay being Washington State's only NERR. Primary emphasis at NERR sites and for the NERR System is on development of programs for stewardship, education and research to enhance informed management and scientific understanding of the Nation's estuarine and coastal habitats (NOAA 1996b). Therefore, as an MPA, the Padilla Bay NERR is categorized in this study as a Research and Educational Marine Preserve[8].

The NERR program provides for coordination and partnership between federal (NOAA) and state government agencies, like Ecology. This involves such aspects as: a joint NOAA-state site evaluation and designation process; state operation and site management of NERR sites; and federal assistance through provisions of the CZMA to coordinate, support, fund and review research, monitoring, education, land acquisition and other site activities and programs (NOAA 1996b).

Padilla Bay NERR as an Ecology-administered MPA

While the Padilla Bay NERR is the result of a federal program as well as state efforts, a few observations about the site are noted here to provide a basic understanding of Ecology's role in managing this MPA.

An on-site staff of eight or more (varies), plus interns, operate the Padilla Bay NERR (Stevens 1997a, in MPA Survey 1996). Management of the NERR is also guided by Advisory Committees for research, education, and

operations. Additionally, the non-profit Padilla Bay Foundation helps develop resources to enhance programs, facilities, operation and management of the Reserve and the Breazeale-Padilla Bay Interpretive Center (Padilla Bay NERR 1996). A new management plan is also under draft to replace the original plan.

Padilla Bay NERR is a focal point for research and educational activities. Research is conducted to monitor plant and animal populations, evaluate sources of pollution, protect water quality and to understand ecological processes operating in the bay and the bay's relationship to greater Puget Sound (Padilla Bay NERR 1996). A field laboratory and overnight quarters for visiting researchers is provided on site (Ecology and NOAA 1994). Educational projects are diverse and extensive, including curricula and classes for levels K-3, 4-8 and high school; teacher workshops; numerous public education events and programs; and scholarships, internships and assistantships for higher education students in estuarine research and education (Padilla Bay NERR 1996).

Efforts to expand the area of the Padilla Bay NERR over its 17 years of operation have been very successful, taking the Reserve from just 500 acres of ownership in 1980 to 11,200 today (Padilla Bay NERR 1996; Stevens 1997a, in MPA Survey 1996). Plans are also being developed for a possible transfer to the Reserve of the adjacent DNR-owned Hat Island (Stevens, personal communication 1997c).

Marine Resource Protection at Padilla Bay NERR

As an MPA, it is also important to understand the approach used at Padilla Bay NERR to protect marine resources. At the Reserve, protection of marine habitats and species is not based on a regulatory approach to limit or restrict consumptive uses. Instead, the intertidal seagrass meadows, mudflats and associated flora and fauna are protected largely through non-regulatory public access limitations established for the site. Visitors are encouraged to stay on designated trails and limited public use areas, thus allowing sensitive areas to be left undisturbed. Additionally, a majority of the estimated 15 miles of shoreline are on private property, with only approximately two miles of public shoreline (Stevens 1997a, in MPA Survey 1996).

Trail guides also remind visitors to the Reserve's shore trail that "no collection of specimens" is permitted (Ecology n.d.a.). At higher tides, however, boats can navigate the bay and fishing is not restricted by the Reserve. There is a WDFW regulation prohibiting commercial salmon fishing in Padilla Bay (WAC 220-47-307), but this is said to be due to the fact that the bay is so shallow (Mills, unpublished, 1995).

Shoreline Management Act

Washington State's Shoreline Management Act (SMA) was passed in 1971, and has the historical distinction of being the nation's first federally approved coastal zone management program under the Coastal Zone Management Act of 1972. The SMA is implemented by the Department of Ecology and local governments.

The SMA mandates the development of local shoreline management programs (SMPs) for purposes of ensuring that the state's coastal zone can be protected while still allowing for appropriate human uses. The SMA also establishes state-wide guidelines, goals and policies to which locally-developed Shoreline Management Programs must conform. The Department of Ecology acts in a supportive and review capacity with primary emphasis on local government compliance with the Act.

The SMA applies throughout the state to all marine waters, submerged tidelands, lakes over 20 acres, all streams with a mean annual flow greater than 20 cubic feet per second, wetland areas, and a 200-foot wide shoreland area extending landward from the ordinary high water mark of all of these aquatic areas (RCW 90.58.030).

The SMA and MPAs

While it is not directly responsible for the designation of marine protected areas identified in this study, the SMA is discussed briefly here in light of the relationship between Ecology's Shoreline Management Program regulatory framework and the potential for the designation of MPAs.

Conservation Element Required

Under the SMA, Ecology adopts guidelines for use by local governments in preparing Shoreline Management Programs. Ecology guidelines require that shoreline management programs contain a number of plan elements that give consideration to such coastal planning and development aspects as locating industrial facilities, public shoreline access, transportation routes, recreational opportunities, and other land use considerations. One of these requirements is for an SMP to contain a conservation element for the preservation of the natural shoreline resources, considering such characteristics as scenic vistas, parkways, estuarine areas for fish and wildlife protection, beaches and other valuable natural and aesthetic features (WAC 173-16-040(3)). While the development of a conservation plan element provides a framework for application of policy and use regulations, it does not ensure or require local establishment of conservation "areas".

Shoreline Environment Classifications

Ecology's SMP guidelines also call for local governments to classify all shoreline areas within their jurisdiction as one of four environment types: natural, conservancy, rural, and urban (WAC 173-16-040(4)). The classification system is designed to encourage uses in each environment which enhance the character of that environment, while also allowing local government to place reasonable standards and restrictions on development in order to prevent the destruction of the character of the environment (Condello, unpublished, 1996; WAC 173-16-040). Of these classifications, the natural environment designation comes the closest to establishing some kind of criteria, albeit not strictly defined, that could assist local governments in identifying intertidal or subtidal areas that should be afforded special protection.

Ecology recommends shoreline areas be classified as **natural environments** when there is actual presence of some unique natural or cultural features considered valuable in their natural or original condition, and which are relatively intolerant of intensive human use (WAC 173-16-040(4)). Guidelines suggest that the intended purpose of natural environments should be to preserve and restore those natural resource systems existing relatively free of human influence, and that activities which may degrade the actual or potential value of the environment should be strictly regulated (WAC 173-16-040(4)).

Shorelines of Statewide Significance

In enacting the SMA, the legislature designated specific shoreline areas as "shorelines of statewide significance" (RCW 90.58.030(e)). Shorelines of state-wide significance are recognized in the SMA as major resources from which all people in the state derive benefit. Among other areas, shorelines of state-wide significance include Puget Sound intertidal areas at: Padilla Bay, Nisqually Delta, Birch Bay, Hood Canal, and Skagit Bay (RCW 90.58.030).

The SMA also calls for shorelines of statewide significance to be treated in SMPs with preference given to uses which favor public and long-range goals. Specifically, these uses are (in order of preference as presented in WAC 173-16-040(5):

(a) Recognize and protect the state-wide interest over local interest;
(b) Preserve the natural character of the shoreline;

(c) Result in long-term over short-term benefit;
(d) Protect the resources and ecology of shorelines;
(e) Increase public access to publicly owned areas of the shorelines;
(f) Increase recreational opportunities for the public on the shorelines.

While these guidelines suggest that shorelines of statewide significance could be considered as another category of marine protective area (Condello, unpublished, 1996), a study by Fox (et al. 1983) reported that these areas have not been managed significantly differently than other shoreline areas.

SMA Summary Remarks

The discussion provided here on the Shoreline Management Act and its potential to influence marine protected area designations at the local level has been brief and, in some respects, raises more questions than answers. Condello (unpublished, 1996) provides a more thorough discussion of the SMA and the regulatory structure it offers for marine area protection, and Fox (et al. 1983) provides insight to the implementation of SMPs based on a study of several local jurisdictions.

The Shoreline Management Programs (SMPs) developed under SMA guidelines have been characterized as supporting a regulatory approach that helps local jurisdictions *react* to incremental development actions (Fox et al. 1983). The SMA, as a planning and permitting tool, is therefore generally not thought of as primary means through which Ecology enables local governments to proactively designate and manage marine protected areas (Eng, unpublished, 1993). A more comprehensive analysis of the SMA, beyond the scope of this study, would be required in order to assess its influence on local MPA planning, designations or management.

Department of Ecology — Summary Remarks

This discussion of the Department of Ecology has portrayed the agency's most direct involvement with existing MPAs as being one of coordination and partnership with NOAA. This is represented in Ecology's operation of the Padilla Bay National Estuarine Research Reserve. Ecology has also partnered with NOAA in the feasibility study for the proposed Northwest Straits National Marine Sanctuary (see Section 4.2).

Ecology's role as the state-level administrator of the Shoreline Management Act (SMA) was also noted in this section. Although this review suggests that the SMA and Ecology-developed guidelines for local government Shoreline Management Programs (SMP)s are not directly utilized to designate and manage local MPAs, the potential for such influence was noted.

4.1.5 University of Washington Friday Harbor Laboratories

The University of Washington's Friday Harbor Laboratories (FHL) have been instrumental in the establishment of several MPAs in Puget Sound. From administration of the oldest subtidal MPA in the state (the 1923-established Marine Biological Preserve), to helping keep a watchful eye on the changing marine environment and fisheries impacts in the San Juans, to leading efforts to justify designation of harvest closures at five Research and Educational Marine Preserve sites — the Friday Harbor Laboratories have played a very active role in the development of Puget Sound MPAs.

Friday Harbor Laboratories have supported volumes of scientific research on the flora and fauna of the San Juan Islands and adjacent waters. In addition to UW, several other regional universities and visiting scientists from around the world conduct research programs and projects at the FHL facilities. In 1996, over 150 independent investigators, students and research assistants carried out research activities at the laboratories (UW FHL 1997).

This research contributes significantly to the scientific body of knowledge in marine biology. A partial listing of scientific papers published resulting from research conducted at the Friday Harbor Laboratories references over 450 papers from 1990 through part of 1997 (UW FHL 1997).

Before further describing the unique MPA involvement of UW's Friday Harbor Laboratories, it is important to note that there are also many other marine laboratories and educational institutions conducting research in Puget Sound, some of which are active in marine area protection. Armstrong and Rembold (1995) identified some 24 marine laboratories and field stations operating in Washington State inland marine waters. However, this study's primary focus on state institutions precludes a complete analysis of all marine laboratories in Puget Sound, although it is known that some of these facilities own private tidelands and discourage public collection of marine biota (Higgins, personal communication 1997; Palsson, personal communication 1997).

UW FHL and MPAs

Friday Harbor Laboratories are discussed here in reference to their administration of a large marine biological preserve (categorized in this study as a Research and Educational Marine Preserve) and their role at five marine preserves (also categorized as Research and Educational Marine Preserves)[9]. **Table 13** lists these MPAs.

Table 13. Puget Sound MPAs Managed or Supported by the University of Washington's Friday Harbor Laboratories

Site Location/ Name	MPA Category	Year of Est.	UW Friday Harbor Laboratories Involvement	Fishery/Harvest Restrictions
San Juan County/ Cypress Island Marine	Research & Educational Marine Preserve	1923	Management; administration of preserve permits	No take of marine biological materials, except for food, kelp, or with permit from the Director of UW FHL, from the saltwaters, bedlands and shorelines of San Juan County and surrounding Cypress Island (RCW 28B.20.320).
SAN JUAN ISLANDS MARINE PRESERVES				
Friday Harbor to Point Caution to 500 yards offshore	Research & Educational Marine Preserve	1990	Leading designation proponent; research; supervision; educational enforcement.	No take of shellfish (WAC 220-56-307; WAC 220-20-025); no take of bottomfish (220-56-230); and no take of food fish except herring; and except salmon for commercial purposes (WAC 220-20-020).
False Bay to 500 yards offshore	Research & Educational Marine Preserve	1990	Leading designation proponent; research; supervision; educational enforcement.	No take of shellfish (WAC 220-56-307; WAC 220-20-025); no take of bottomfish (220-56-230); and no take of food fish except herring; and except salmon for commercial purposes (WAC 220-20-020).
Argyle Lagoon	Research & Educational Marine Preserve	1990	Leading designation proponent; research; supervision; educational enforcement.	No take of shellfish (WAC 220-56-307; WAC 220-20-025); no take of bottomfish (220-56-230); and no take of food fish except herring; and except salmon for commercial purposes (WAC 220-20-020).
Yellow and Low Islands to 300 yards offshore	Research & Educational Marine Preserve	1990	Leading designation proponent; research; supervision; educational enforcement.	No take of shellfish (WAC 220-56-307; WAC 220-20-025); no take of bottomfish (220-56-230); and no take of food fish except herring; and except salmon for commercial purposes (WAC 220-20-020).
SW Shaw Island to 500 yards offshore	Research & Educational Marine Preserve	1990	Leading designation proponent; research; supervision; educational enforcement.	No take of shellfish except crab in Parks Bay (WAC 220-56-307; WAC 220-20-025); no take of bottomfish (220-56-230); and no take of food fish except herring; and except salmon for commercial purposes (WAC 220-20-020).

The San Juan County/Cypress Island Marine Biological Preserve

In 1923, the state legislature, recognizing the importance of the rich and diverse marine biological resources of the waters of San Juan County and those surrounding adjacent Cypress Island in Skagit County, designated this large area a Marine Biological Preserve (RCW 28B.20.320). The Marine Biological Preserve was established to create an area that protected and preserved marine biological materials useful for scientific purposes. Under the Marine Biological Preserve's defining statute (RCW 28B.20.320), the collection of any marine biological materials other than that taken for food, and also excepting kelp, is prohibited unless written permission is obtained from the Director of Friday Harbor Laboratories (RCW 28B.20.322). Violation of this statute's harvest restriction carries a potential misdemeanor charge (RCW 28B.20.324).

The effectiveness of this large biological preserve area is largely unmeasurable, as is the extent of violations associated with the harvest restrictions. While hundreds of Preserve-based research studies have been conducted and results published, very little documentation exists regarding the management of the Preserve and its effect on marine resource conservation. Resources are not available to implement a level of supervision, enforcement, research and monitoring that could answer questions about the Preserve's effectiveness (Duggins, personal communication 1997; Staude, personal communication 1997).

In a 1989 report on Washington State nongame marine invertebrates, Kyte (1989) characterized the Marine Biological Preserve as presenting a unique management challenge. Kyte noted a number of concerns, including the fact that collection permits were granted by the Director of the Friday Harbor Laboratories for a variety of researchers and commercial collectors; that a record of all such collections did not exist; that the Laboratories did not keep records of population levels in the Preserve; that management and conservation programs had not been implemented for the Preserve; and that clarification was needed on management and permitting responsibility relationships between UW and the Washington Department of Fisheries (Kyte 1989).

Despite these limitations, FHL became a chief proponent of more protective MPAs for the area.

San Juan Island Marine Preserve Areas

As was previously discussed in Section 4.1.2 on the WDFW, FHL was a primary proponent behind the 1990 WDFW designation of five San Juan Islands Marine Preserves. These five MPAs (see **Table 13**), primarily located adjacent to UW-owned uplands and tidelands, were recommended by Friday Harbor Laboratories for complete closure (as no-take MPAs). The designated preserves, however, allow fishing for salmon and herring at all sites, and for crab in Parks Bay, while prohibiting the take of bottomfish and all other shellfish and foodfish.

Impetus for Designation

Several factors supported the Friday Harbor Laboratories-initiated proposal and WDFW action to establish the marine preserves. Among these were the rapid growth of the sea urchin fisheries in San Juan waters; reports of fishery regulation violations and an apparent lack of effective enforcement capability; damaging effects of sea urchin population crashes in California from over-harvestation; institutional concerns over the loss of marine life populations, such as sea urchins, that are extremely valuable to research; and the inability of the existing Marine Biological Preserve (with only its prohibition on the unpermitted take of non-food marine biota) to protect resources such as sea urchins and sea cucumbers that had emerged into growing fisheries (WDF 1988a; Duggins, personal communication 1997).

FHL Management of the San Juan Island Marine Preserves

Primary FHL management objectives for the designated San Juan Islands Marine Preserves include scientific research and the preservation of species and genetic diversity (Duggins, personal communication 1997; Staude, personal communication 1997). Use of the preserves for public education is not a priority management objective at these sites, as they are managed to reduce public impact upon the resources (Duggins, personal communication 1997; Staude, personal communication 1997).

Supervision, management and enforcement duties for the Preserves are provided by Friday Harbor Laboratories on a *de facto* basis (Duggins, personal communication 1997). There are no official programs or management plans developed, and no specific staff assigned for such purposes. Researchers working at the Preserves keep an eye out for potential violations of WDFW fishery regulations (see Table 13), as do some property owners and caretakers of adjacent protected areas such as the Nature Conservancy preserve at Yellow Island (Duggins, personal communication 1997; Johns, personal communication 1997; Staude, personal communication 1997). When encountering fishers in the Preserves, an educational approach is most often used to make sure that these users understand the state regulations in place and the purpose for the Preserves. Signage is limited on shorelines, and further limited on-water.

Due to resource constraints, a monitoring program for the Preserves has not been developed. However, recent monitoring of rocky reef fish populations at Shady Cove, a portion of the Friday Harbor-to-Point Caution San Juan Island Marine Preserve (see Table 13) has been conducted by WDFW (Palsson and Pacunski 1995), and represents one effort to assess the function and effectiveness of Preserve areas. This study, which compared fished and protected sites throughout Puget Sound, noted that although Shady Cove was part of a relatively new MPA (of four years at the time of study), it contained greater abundance and larger sizes of select bottomfish than that found at fished sites (Palsson and Pacunski 1995).

UW Friday Harbor Laboratories — Summary Remarks

This brief review has portrayed the University of Washington's Friday Harbor Laboratories as a state institution strongly committed to the establishment of MPAs. This commitment has been shown in the work done by FHL to call for and help bring about the designation of five San Juan Island Marine Preserve sites. Their contribution to the development of MPAs in the San Juan Islands area continues today, as they have assisted the County of San Juan in developing the eight newly designated (June 1997) Voluntary No-Take Bottom Fish Recovery Areas (to be discussed in Section 4.4 on local government).

4.2 Federal Agencies

4.2.1 Introduction

Several federal agencies have responsibilities for managing marine resources and activities within Puget Sound. This includes, but is not limited to, those agencies listed and described in **Table 14**. When considering marine protected area establishment and management, a number of these agencies may become involved in a variety ways, such as providing initial consultation, exercising jurisdictional regulatory authority over protected area resources and activities, or possibly contributing to site management duties. As with state institutions, the federal framework provided for MPA development and management is divided among several agencies that are directed by a variety of marine resource management policies and legislation.

Of the agencies listed in Table 14, this section notes the involvement of two federal agencies that are involved with designated and proposed marine protected areas in Puget Sound: the U.S. Fish and Wildlife Service

(USFWS) and the National Oceanic and Atmospheric Administration (NOAA). The discussion of USFWS centers on their role in managing four National Wildlife Refuges in the Puget Sound area. The National Wildlife Refuge discussion comprises the primary topic of this section.

The discussion presented here concerning NOAA's involvement with Puget Sound MPAs centers on the agency's study of the proposed Northwest Straits National Marine Sanctuary. Additionally, an existing Puget Sound MPA designated and supported by NOAA is the Padilla Bay National Estuarine Research Reserve, which, because it is staffed and operated by the Washington Department of Ecology, was previously discussed at Section 4.1.4.

Table 14. Federal Agencies with Responsibilities for Marine Resource/Activity Management and/or Protected Area Establishment in or Adjacent to Puget Sound[1]

Federal Agency	*Marine Resource or Activity Management and/or Protected Area Establishment Responsibilities*
Army Corps of Engineers (ACOE)	Under Section 404 of the Clean Water Act, the ACOE regulates the discharge of dredged or fill material into waters of the U.S. (including tidally influenced wetland areas).
Bureau of Land Management (BLM)	Administers public lands under the Federal Land Policy and Management Act of 1976 (FLPMA). A small number of BLM-managed areas, including two Areas of Critical Environmental Concern, are located along shores, but not tidelands, of Puget Sound.
Environmental Protection Agency (EPA)	Several responsibilities under the Clean Water Act, such as federal administration of the National Pollutant Discharge Elimination System (NPDES) and review and approval of the state's coastal nonpoint source pollution control program. Along with the Washington State Department of Ecology and the Puget Sound Water Quality Action Team, involved in development and implementation of the state's comprehensive conservation and management plan (the Puget Sound Water Quality Management Plan), which, under the National Estuary Program, recommends corrective actions to address point and non-point source pollution in nationally significant estuaries. Puget Sound was designated an estuary of national significance in 1988.
National Oceanic and Atmospheric Administration (NOAA)	Under the Coastal Zone Management Act of 1972, NOAA's Office of Ocean and Coastal Resources administers the National Estuarine Research Reserve (NERR) System. There is one NERR site in Washington State located at Padilla Bay. The Sanctuaries and Reserves Division administers the National Marine Sanctuary Program. Of the 12 designated and two proposed Sanctuaries, two are located in Washington State: the Olympic Coast National Marine Sanctuary (not within Puget Sound) and the proposed Northwest Straits National Marine Sanctuary (recently deactivated from consideration.) The National Marine Fisheries Service (NMFS), under the Magnusen Act, is charged with ensuring a continuous supply of harvestable marine and anadromous fish. Under agreement with WDFW, NMFS enforcement personnel are deputized to enforce state fishery laws within state waters, such as Puget Sound. NMFS also shares responsibility with USFWS for enforcing the Marine Mammal Protection Act and the Endangered Species Act.
National Park Service (NPS)	Establishes and operates system of National Parks. National Park areas adjacent to Puget Sound include Olympic National Park (no Puget Sound shorelines), the San Juan Islands National Historic Park (adjacent to public tidelands), and Ebey's Landing National Historic Reserve (upland) on Whidbey Island.
U.S. Coast Guard (USCG)	Enforces the Act to Prevent Pollution From Ships. Enforces Clean Water Act marine sanitation regulations issued by EPA. Involved in oil and hazardous substance spill investigation and cleanup supervision under the Clean Water Act (National Contingency Plan for Region IX) and in cooperation with the EPA.
U.S. Fish and Wildlife Service (USFWS)	Establishes and manages a system of National Wildlife Refuges (NWR)s under the National Wildlife Refuge System Improvement Act of 1997, including four Puget Sound Refuges: Protection Island NWR, Dungeness NWR, San Juan Islands NWR, and Nisqually NWR. USFWS also enforces the Migratory Bird Conservation Act, and the Endangered Species Act.
U.S. Navy	Operates large Naval Air Station base at Whidbey Island and facilities at Indian Island and other Puget Sound areas. Carries out various marine surface level and underwater training, transport and other activities. Restricted shoreline areas at some of these bases may serve indirectly as protected intertidal areas.

1. List of agencies and descriptions of marine-associated responsibilities is representative, not comprehensive.

4.2.2 U.S. Fish and Wildlife Service: National Wildlife Refuge System

National Wildlife Refuges

The U.S. Fish and Wildlife Service (USFWS) administers the National Wildlife Refuge (NWR) System. The mission of the NWR System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans (USFWS 1997c). As of November 1997, the NWR System consisted of 512 National Wildlife Refuges comprising over 90,000,000 acres (Takekawa, personal communication 1997c).

The following long range goals of the NWR System indicate the program's priorities for protecting endangered and threatened species and migratory birds, while allowing compatible recreational uses:

- To preserve, restore, and enhance in their natural ecosystem (when practicable) all species of animals and plants that are endangered or threatened with becoming endangered;
- To perpetuate the migratory bird resource;
- To preserve a natural diversity and abundance of fauna and flora on refuge lands;
- To provide an understanding and appreciation of fish and wildlife ecology and people's role in their environment, and to provide refuge visitors with high quality, safe, wholesome and enjoyable recreational experiences oriented toward wildlife, to the extent these activities are compatible for which the refuge was established (USFWS 1997b).

As a result of the United States' responsibilities under international treaties for migratory bird conservation, the vast majority of National Wildlife Refuges, including those in Puget Sound, were established with a primary objective to protect migratory birds. National Wildlife Refuges are also well known as areas providing protection to and secure habitat for endangered and threatened species (USFWS 1992c).

Aquatic habitat and fishery resources are also managed by the USFWS on some Refuges. Of some 281 refuges containing fishery resources, four have been established specifically to conserve and enhance fisheries, though these are not sites within Puget Sound (USFWS 1997a).

In establishing National Wildlife Refuges and carrying out the above-listed goals of the NWR System, the USFWS is directed by a number of federal laws. **Table 15** presents a summary list of federal laws most commonly associated with National Wildlife Refuges (USFWS 1985; 1992; 1997b).

Table 15. Federal Laws Affecting National Wildlife Refuges[1]

Federal Law	*Description*
Protection of Species	
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712)	Provides for regulations to control taking, selling, transporting and importing migratory birds, their nests, eggs, parts or products, and provides enforcement authority and penalties for violations.
Bald and Golden Eagle Protection Act (16 U.S.C. 668-668C)	Makes it illegal to import, export, or take bald or golden eagles, or to sell, purchase, or barter their parts, or products made from them, including their nests or eggs.
Endangered Species Act of 1973 (16 U.S.C. 1531-1543)	Instructs federal agencies to carry out programs to conserve the ecosystem on which these species depend.
Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407)	Provides authority to Secretary of Interior and Commerce to enforce provisions against the "taking" or importation of marine mammals.
Refuge Establishment and Management	
National Wildlife Refuge System Improvement Act of 1997	Provides guidelines and directives for administration of all National Wildlife Refuges for the conservation of fish and wildlife. Authorizes uses of a Refuge if USFWS determines such uses to be compatible with the major purposes for which the Refuge was established.
Migratory Bird Hunting and Conservation Stamp Act of 1934 (16 U.S.C. 718-718h)	Also known as the "Duck Stamp Act." Requires each waterfowl hunter 16 years of age or older to possess a valid Federal hunting stamp. Receipts from the sale of stamps are deposited in the Migratory Bird Conservation Fund, which provides funds for the acquisition of migratory bird refuges.
Migratory Bird Conservation Act of 1929 (16 U.S.C. 715-715r)	Establishes a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds.
Land and Water Conservation Fund Act (16 U.S.C. 460L-4-460L-11; 78 Stat. 897)	A primary source of funds to support USFWS acquisition of refuge lands.
Public Recreational Use of Wildlife Refuges	
Refuge Recreation Act of 1962 (U.S.C. 460k-460k-4)	Authorizes the recreational use of Refuges when such uses are compatible and do not interfere with the area's primary purpose. Authorizes charging of fees for public use.
Refuge Trespass Act of 1909	Makes it unlawful (except in compliance with rules and regulations) to hunt, trap, capture, willfully disturb, or kill any bird or wild animal on a National Wildlife Refuge.
Public Involvement in Decision Making	
National Environmental Policy Act of 1969 (42 U.S.C. 4321-4347)	Requires federal agencies to consider the environmental and social impacts of federal actions, and ensure public involve ment in decision making processes, such as those related to establishment of or management planning for National Wildlife Refuges.

1. This list is representative, not comprehensive. Many Executive Orders and Public Laws also affect individual Refuges.

Sources: USFWS 1985; 1992; 1997b.

National Wildlife Refuges as MPAs in Puget Sound

The four National Wildlife Refuges that contain and manage intertidal or subtidal areas within Puget Sound are:

- Protection Island NWR
- San Juan Islands NWR
- Dungeness NWR
- Nisqually NWR

Each of these Refuge sites provides important habitat for breeding seabirds, marine mammals and/or migratory waterfowl, shorebirds and waterbirds. However, management approaches regarding public use differentiate each in terms of their role in protecting marine resources and functioning as MPAs. In this study, two of the

NWR sites are identified as Marine Habitat/Nature Preserves, while the other two are categorized as Multiple Use Protected Areas. **Table 16** provides basic information about these sites. A brief overview of each site and its role as an MPA is discussed next.

Protection Island NWR

The Protection Island National Wildlife Refuge, located in Jefferson County, was officially designated in 1988 to "provide habitat for a broad diversity of bird species, with particular emphasis on protecting the nesting habitat of the bald eagle, tufted puffin, rhinoceros auklet, pigeon guillemot, and pelagic cormorant; to protect the haulout area of harbor seals; and to provide for scientific research and wildlife-oriented public education and interpretation" (USFWS 1985). The 364 acre island supports a high concentration of breeding seabirds, and sand spits at both ends of the island provide important haulout and pupping areas for harbor seals (Hirsh 1981; USFWS 1985).
The Refuge also includes a surrounding marine buffer area of approximately 343 acres. In 1988, DNR withdrew from leasable status the public bedlands surrounding the entire island and extending 600 feet offshore from the line of extreme low tide (DNR 1988c; Edens, personal communication 1997a; Hesselbart, personal communication 1998). Signs posted on shore advise boaters to remain 200 yards from the island. Public tidelands have been leased by DNR to the USFWS. Additionally, under a cooperative agreement with WDFW, USFWS assists in the management of the adjacent 48 acre Zella M. Schultz Seabird Sanctuary (previously discussed in Section 4.1.2).

The general management policy for Protection Island NWR is hands-off in nature; public access to the island is not allowed, except for a few island property owners. Thus, this MPA is categorized as a Marine Habitat/Nature Preserve, as shown in Table 16. This strict policy, along with the 200-yard boater-approach buffer, is deemed necessary to provide disturbance-free habitat suitable for seabird nesting and harbor seal use. Additionally, the Refuge's marine buffer area can be seen as providing a level of indirect protection to other resources found within the encompassed intertidal and subtidal zone.

Day to day operations and maintenance of the Refuge is provided by a volunteer caretaker that lives on site, weekly visits by maintenance staff, and weekly summer visits by the Refuge manager and a biologist (Edens 1997b). The site supports approved research projects, but is not a focal point for on-site public education and outreach activities (Edens 1997b).

San Juan Islands NWR

The San Juan Islands National Wildlife Refuge consists of 83 rocks, reefs and islands throughout the San Juan Archipelago comprising 449 acres. Acquisition of these small areas has taken place from 1914 through 1976. Eighty of the islands are also designated as National Wilderness Areas. The Refuge provides nesting and loafing sites for several seabird species, such as glaucous-winged gulls, cormorants, pigeon guillemots, rhinoceros auklets, black oystercatchers, and a variety shorebirds. Harbor seals haul out on several islands, and habitat is provided for endangered and threatened species such as peregrine falcons and bald eagles.

The primary purpose of the Refuge is to "facilitate the management of migratory birds for which the United States has a responsibility under international treaties and to further effectuate the purposes of the Migratory Bird Conservation Act" (USFWS 1986). Specific goals set for this MPA are:

(1) To protect and preserve habitat to support populations of resting and nesting seabirds, gulls, and shorebirds of levels not less than current populations;

(2) To preserve and manage habitat capable of supporting a diversity of wildlife, with special emphasis on bald

eagles and harbor seals at current levels of use;

(3) To provide public information and interpretation of the wildlife resources of the Refuge;

(4) To provide wildlife-oriented public recreation while discouraging non-wildlife oriented and non-conforming uses on the Refuge; and

(5) To cooperate with other agencies, institutions of higher education, and private organizations and individuals in providing technical assistance and research opportunities (USFWS 1986).

As with Protection Island NWR, this MPA is categorized as a Marine Habitat/Nature Preserve given its objectives and the fact that it is nearly completely closed to public use. Such strict closure is necessary for protection of easily disturbed seabirds, shorebirds, marine mammals and endangered species. Areas open to the public include five-acres on Matia Island and all of Turn Island, which are cooperatively managed with the Washington State Parks and Recreation Commission; these sites are Marine State Parks (see Section 4.1.3 for a discussion on Marine State Parks).

Some on-site signage, as well as brochures and other materials posted and distributed off site, advise boaters to stay 200 yards from Refuge sites. However, unlike Protection Island NWR, these public aquatic lands have not been withdrawn by DNR or leased to the USFWS. The 200 yard Refuge approach limit is advisory in nature, not backed by a specific law or legal authority.
However, laws and regulations that could apply in this buffer area, and could be enforced by USFWS, include the prohibitions on harassment under the Migratory Bird Treaty Act and the Marine Mammal Protection Act, and prohibitions on disturbance under Refuge regulations (Takekawa, personal communication 1997c).

USFWS on-site management is very limited due to budgetary and personnel ceiling constraints. Supervision by USFWS is limited to approximately 1 to 2 weeks during summer biological survey and maintenance visits. State Parks boat-based rangers and summer volunteers associated with the Whale Museum and USFWS provide additional seasonally-limited presence. USFWS staff have reported trespassing, wildlife disturbance and collection of some intertidal organisms (such as sea urchins) to be growing problems. It has been suggested that an aquatic land lease to establish a marine buffer area (such as that found at Protection Island NWR) around larger islands might be one step toward reducing these disturbances (Vicencio 1996).

Off-site public education efforts include signage, brochures and other contact with the public aimed at creating awareness of and concern for the Refuge and related resource problems. Interpretive work, including activities on the water, is carried out by external groups such as the Whale Museum in Friday Harbor and through the seasonal efforts of volunteers. Research and monitoring activities, such as annual seabird surveys, are also supported by the Refuge.

Dungeness NWR

The Dungeness National Wildlife Refuge differs from the Protection Island and San Juan Islands NWRs in that it provides opportunities for a significant level of public recreational activities compatible with a primary objective of protecting and preserving wildlife and habitat.

The Dungeness National Wildlife Refuge was first established in 1915 by Executive Order and encompassed the 5 1/2 mile long Dungeness Spit near Sequim in Clallam County. Additional acquisition of tidelands in 1943 and forested uplands in 1971 and 1972 brought the Refuge's current size to 631 acres (USFWS 1997b).

In addition to the general long-range goals applicable to all National Wildlife Refuges (previously listed), specific objectives for Dungeness NWR, listed in order of highest to lower priority, are:

(1) To provide and preserve habitat for the enhancement of wintering waterfowl and other migratory birds with emphasis on black brant;

(2) To protect and maintain natural habitats capable of supporting a diversity of wildlife;

(3) To provide public information, interpretation, and education on the wildlife resources of the Refuge;

(4) To provide wildlife-oriented recreation; and

(5) To cooperate with other agencies, educational institutions, and private organizations and individuals in providing technical assistance and research opportunities consistent with Refuge objectives and management needs (USFWS 1997b).

Dungeness NWR provides habitat for a diverse number of wildlife species, including over 250 species of birds, eight species of marine mammals and 41 species of land mammals. Eelgrass beds and tidal mudflats along the inner Bay are important feeding and roosting areas for a variety of waterfowl, such as migratory black brant, and shorebirds, seabirds and other bird species. Harbor seals use the end of Dungeness Spit for hauling out and pupping. Tideflat areas support crabs, clams and other shellfish, while open waters of Dungeness Bay and Harbor are used by salmon and other fish species (USFWS 1997b). Endangered peregrine falcons and threatened bald eagles, marbled murrelet and western snowy plovers have all been recorded at the Refuge (USFWS 1997b).

Supervision of the site is increased by comparison to the Protection Island and San Juan Islands NWRs. Year-round staff on site include a refuge manager, biologist, and volunteer caretaker. Additional supervision, maintenance and public education services are provided by a weekend park ranger, maintenance staff, and some 35 daily summer volunteers (Edens 1997b).

As an increasingly popular destination for visitors, Dungeness NWR accommodates a wide variety of human activities. These include: hiking, walking, jogging, boating, wildlife observation and photography, horseback riding, fishing, shellfishing, other recreational beach activities. Refuge visitation has increased significantly in recent years, rising 67% between 1988 and 1994 to an annual level of 110,000 visitors (USFWS 1997b).

In January of 1997, a revised management plan to address public use of the Dungeness NWR was completed through a public process (USFWS 1997b). The need for such action is centered on concerns about increases in public visitation and a decline in use by wildlife, including black brant, other waterfowl and harbor seals. Specific issues of concern are: (1) disturbance of black brant, other waterfowl and shorebirds by increased public use activities; (2) disturbance of harbor seals at the tip of Dungeness Spit; and (3) non-wildlife-dependent recreational activities reducing the quality of experience for visitors engaged in wildlife observation (USFWS 1997b).
The outcome of the planning process for public use at Dungeness NWR attempts to address the challenge of meeting the needs of wildlife (the primary purpose of the NWR) while ensuring allowed public use activities are compatible, giving priority to wildlife-dependent uses (USFWS 1997b). Through use of an activity zoning scheme, the new plan attempts to preserve and protect sensitive wildlife and habitat areas with a system of year-round closed areas and seasonally limited zones, and also seeks to reduce conflicts between various public uses. For example, areas where public access is prohibited year-round include the tip of Dungeness Spit, the inside (Bay side) edge of the majority of the Spit, and Graveyard Spit, which is designated as a Research Natural Area[10]. It is in this sense that the Dungeness NWR can be categorized as a Multiple Use Protected Area.

Nisqually NWR

The Nisqually National Wildlife Refuge is in some ways similar to the Dungeness NWR, in that it accommodates multiple users while preserving fish and wildlife habitat. Located in Thurston County and designated in

1974, the Nisqually NWR features 2,973 acres of estuaries, mudflats, saltmarsh, freshwater marshes, grasslands and riparian woodlands at the Nisqually Delta. The Nisqually Delta is one of the largest remaining undisturbed estuaries in Western Washington, and the Refuge preserves important habitat for waterfowl, shorebirds, raptors and water birds. McAllister Creek and Nisqually River serve as spawning, rearing and passage areas for anadromous fish.

Fishing and shellfish harvest are popular activities at Nisqually NWR. McAllister Creek and the Nisqually River are popular with recreational anglers in pursuit of salmon and trout, while tideland areas support bottomfish angling and recreational shellfish harvest. Additionally, the Nisqually Tribe operates a commercial gill net fishery for salmon (USFWS 1983).

A fishing plan has been developed for the Refuge that establishes designated open and closed bank fishing areas (USFWS 1983; 1996a). Factors considered in the development of this plan included loss the of river bank area, unsafe conditions, use of bank habitat by fish and wildlife, limitations of USFWS administrative control, and the potential for conflicts between various users of the Refuge and adjacent areas (bank and boat-based recreational and tribal fishers, hunters, and other visitors) (USFWS 1983). Tideland areas of the Refuge remain open to recreational fishing and shellfish harvest activities, subject to applicable WDFW regulations (USFWS 1996a).

The Nisqually NWR is also a popular area for wildlife observation. Seven miles of trails, observation decks and photo blinds are provided. The Refuge also provides interpretive displays and operates an outdoor environmental education program and on-site education center. Volunteers are regularly employed to help with interpretation, environmental education, resource management, maintenance, administration and other special projects. The refuge also contains a Research Natural Area in the northeast portion of the tideflats, and a Public Use Natural Area has been designated at a surge plain wetland along the Nisqually River. Additionally, the delta area outside the Brown farm dike is designated as a National Natural Landmark[11] (Hesselbart, personal communication 1998).

Public use restrictions are generally directed at minimizing disturbances to wildlife and habitat but do not reveal a particular emphasis on marine resource protection (excepting the bank fishing area limitations mentioned above). For example, pets, firearms, bicycles, fires and camping are prohibited, and active sport activities are discouraged (USFWS 1996a).

Consistent with NWR System objectives, Nisqually NWR strives to provide visitors with wildlife-dependent opportunities to the extent that these activities are compatible with conservation objectives (such as preservation of migratory bird resources and protection of endangered and threatened species). As an MPA, therefore, the Nisqually NWR is perhaps most accurately categorized as a Multiple Use Protected Area.

4.2.3 National Oceanic and Atmospheric Administration (NOAA)

NOAA's most direct involvement with MPAs in Puget Sound has been the Sanctuaries and Reserves Division's feasibility study of the proposed Northwest Straits National Marine Sanctuary.

Proposed Northwest Straits National Marine Sanctuary

NOAA and Washington state, through the Department of Ecology, worked in partnership from 1989 through 1997 on a feasibility study for the proposed Northwest Straits National Marine Sanctuary. "Northwest Straits" is the name assigned to a large study area encompassing the Washington inland marine waters of the Strait of Juan de Fuca, San Juan Islands archipelago, Strait of Georgia waters to the Canadian border, and waters south to

the southern tip of Whidbey Island. This study process has been conducted under the authority of the National Marine Sanctuaries Act (NMSA) of 1972 (16 U.S.C. 1431 et seq., as amended) and the National Environmental Policy Act (NEPA).

Table 16. National Wildlife Refuges in Puget Sound

Refuge Name	*Year of Est.*	*Sub-Tidal Acres*	*Inter-tidal Acres*	*Up-land Acres*	*Total Acres*	*Marine Resource Protection (and comments)*	*MPA Category*
Protection Island NWR	1988	yes[2]	yes[2]	316	659	No public access to island, excepting property owners. To prevent disturbance to marine birds and marine mammals, shore-posted signs advise boaters not to enter a marine buffer area that extends from shore to 200 yards offshore and encircles the Island. (This also provides some level of indirect protection to other intertidal and subtidal resources within this buffer area). This buffer area was established through DNR withdrawal of adjacent aquatic lands (see note 2 below).	Marine Habitat/ Nature Preserve
San Juan Islands NWR	1914 thru 1976	no	yes [3]	yes	449	No public access to all but two of 83 rocks, reefs and islands. Boaters encouraged to stay 200 yards offshore from Refuge sites.	Marine Habitat/ Nature Preserve
Dungeness NWR	1915	no	yes	yes	631	Year-round and seasonally limited public access restrictions at various zones, including tidelands, aimed at protecting waterfowl, shorebirds, threatened and endangered bird species, harbor seals and their habitats. (Other intertidal marine species and habitat receive indirect protection at restricted areas).	Multiple Use Protected Area
Nisqually NWR	1974	no	yes	yes	2973	Some off-limit marsh areas (Fishing and shellfishing are allowed).	Multiple Use Protected Area

1. The MPA Categories used in this study are defined and discussed in Section 3.1.2.
2. Subtidal and intertidal acreage are split, in unknown proportions, between approximately 343 acres of second class tidelands and subtidal waters encircling the island and extending to 600 feet from the line of extreme low tide (Edens 1997b). The subtidal area (bedlands) was withdrawn from leasable status by DNR in 1988 for purposes of protecting the resources of Protection Island and in cooperation with USFWS. Public tidelands have been leased to the USFWS by DNR.
3. Although it is understood that the seaward boundary of the Refuge is the line of mean high tide (Vicencio 1996), the 9 acres of reefs, said to be "awash" at high tide, are considered here as intertidal area.

National Marine Sanctuaries

National Marine Sanctuaries, which have been designated at 12 locations throughout the nation, are established in nationally significant areas of the marine environment to ensure comprehensive management and protection of their conservation, recreational, ecological, historical, research, and educational or aesthetic resources and qualities (NOAA 1996b). There is one National Marine Sanctuary located in Washington State, the Olympic Coast National Marine Sanctuary. Designated in 1994, the sanctuary is located in the waters off the Washington coast, from Cape Flattery to the Copalis River. Its boundaries encompass some 3,300 square miles of state and federal waters (NOAA 1996b).

As MPAs, National Marine Sanctuaries can be generally characterized as large areas (with a few exceptions) that facilitate multiple uses consistent with a primary objective of resource protection. National Marine Sanctuaries are well known as focal points for marine research, monitoring, education and public outreach, with less focus on use-restrictive and regulatory approaches to management. At some larger sanctuaries, such as the Florida Keys, a zoning scheme has been developed where various MPAs, or management zones, have been established and range from smaller strict no-take reserve areas to larger recreational areas.

The Northwest Straits Study Process

The history of the recently discontinued planning process for the proposed Northwest Straits National Marine Sanctuary is long and complex. A brief discussion of this process is provided here, including mention of major institutional challenges for the project. The complexities of such a proposal are revealing not only for this project, but shed light on some of the common challenges presented to any institution seeking to establish, or even publicly study the possibility of, MPAs in Washington State waters.

History of the Study Process

The history of the proposed Northwest Straits National Marine Sanctuary dates back to 1982, when an evaluation team, working from a citizen-initiated effort, recommended to NOAA that several areas within the state should be added to a NOAA site evaluation list. Of top priority among these recommended areas were about 250-275 square miles of waters surrounding the San Juan Islands (Chelsea 1987). Additional steps did not then take place until 1988, when Congress reauthorized and amended Title III of the Marine Protection, Research, and Sanctuaries Act (MPRSA), and, in so doing, directed NOAA to study further 430 square miles of waters centered around the San Juan Islands for consideration as what was then referred to as the Northern Puget Sound National Marine Sanctuary (NOAA and Ecology 1995a).

From 1989 through 1996, the study involved NOAA and Ecology directing an extensive public consultation process. During this time, a combination of public scoping meetings, information forums, focus groups, and workshops (in all well over 50) were held as resource management issues and concerns were studied and documented, public comment and input solicited, and a Working Advisory Committee was formed to assist in the study (NOAA 1992b; NOAA and Ecology 1995a). The project's Working Advisory Committee and issue-specific subcommittees, which were active from 1989 through 1991, brought together nearly 100 participants representing state, federal, tribal and local government, commercial fishing interests, environmental organizations, civic organizations, shipping and port interests, recreational boating interests, and academic institutions (NOAA 1992b; NOAA and Ecology 1995a). Along the way, the study area was expanded twice to its final boundaries (see original description) based on various public and agency input received.

Throughout this process, NOAA and Ecology, recognizing the area's rapidly growing population and the associated cumulative impacts on marine resources from such growth, identified key problem issues such as: degraded water quality; habitat reduction; losses in biological populations; and corresponding losses of uses and benefits from these resources (NOAA 1992b; 1995b). Suggestions for the role of a marine sanctuary have been largely based on (but not limited to) the area's need for enhanced and coordinated efforts in areas such as research and monitoring, education, and resource protection enforcement (NOAA 1992b).

In 1994, NOAA and Ecology entered into a Memorandum of Agreement (MOA) whereby they agreed to jointly carry out the sanctuary designation process and development of a draft Environmental Impact Statement and Draft Management Plan (DEIS/DMP) (NOAA 1997). 1995 and 1996 saw continued work between NOAA and Ecology on the development of the DEIS/DMP, with challenging negotiations taking place between NOAA and the state regarding identification of the role for the sanctuary program.

In September of 1996, Congressional interest in the Northwest Straits project increased during the reauthorization of the National Marine Sanctuaries Act (NMSA) (Dutton 1996). Out of this interest, members of Congress from Washington State (U.S. Senator Patty Murray and U.S. Representative Jack Metcalf) moved to convene a "blue ribbon" citizens panel to form the Northwest Straits Citizens Advisory Commission. In session since May of 1997, the Commission considered what special management actions (whether a National Marine Sanctuary or other) are appropriate for increasing protection to the marine resources of the area. NOAA's Sanctuaries and Reserves Division and Ecology have provided technical support to the Commission when requested. The Commission's final draft report to the convenors did not recommend the establishment of a National Marine Sancuary, although it did include a recommendation for the establishment of a scientifically-based regional system of MPAs (Murray-Metcalf, NW Straits CAC 1998).

Having been directed by Congress during the 1996 reauthorization of the NMSA to consider the recommendations put forward by local groups such as the Commission, and taking into consideration many other complex factors, NOAA made the decision in 1998 to discontinue active consideration of the proposed Sanctuary (Malek, personal communication 1998).

Challenges Presented

The study process for the proposed sanctuary has been complex and often controversial. In evaluating the Northwest Straits area, NOAA is guided by certain standards, set under the NMSA, for designation as a National Marine Sanctuary. These standards require the determination that:

(A) The area is of special national significance due to its resource or human-use values;

(B) Existing State and Federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education;

(C) Designation of the area as a national marine sanctuary will facilitate the objectives of (B); and

(D) The area is of a size and nature that will permit comprehensive and coordinated conservation and management.

Throughout the study process, a number of institutional concerns and challenges have been identified and debated. These include, but are not limited to concerns about: federal jurisdiction in state waters; duplication of effort; increased regulations; and insufficient resource protection provided by a Sanctuary. At the same time, supporters of the concept of a Sanctuary in the Northwest Straits have pointed out that there is a need for a coordinating body to help bring greater focus and effectiveness to marine resource protection in these waters, that the National Marine Sanctuary Program has a proven ability to help develop the kind of valuable research, monitoring, and education programs that are needed in local waters, and that the state and local institutions may not have the resources or will to bring to bear this level of implementation.

One of the unique challenges the proposed Northwest Straits National Marine Sanctuary presents for NOAA and Ecology is the determination of an agreed-upon role for this federal program being considered for this all state-waters site. Unlike the nation's twelve existing designated Sanctuaries which include federal waters (in whole or part), the Northwest Straits is proposed for designation in waters completely under state jurisdiction. The result, in Washington State, is a cooperative state-federal planning process in which the Governor of the state has a complete say in the outcome. With direct Congressional interest and involvement recently being added to the mix, the Northwest Straits proposed National Marine Sanctuary represents perhaps the most complex MPA proposal for the Puget Sound region the state has dealt with to date.

4.3 Treaty Tribes

Washington's coastal Indian tribes play a unique and important role in the management and protection of marine resources throughout the state. Under treaty obligations dating back to the 1850s, western Washington tribes hold interests and rights to harvest fish and shellfish, and in the protection of fisheries habitat. Along with the state, the tribes cooperatively manage fishery resources. This responsibility and interest make the tribes of Washington State vital stakeholders and closely involved governmental bodies where marine protected areas are concerned.

Under treaty obligations, the tribes are entitled to the legal right to take natural resources, including fish, at all usual and accustomed grounds and stations. The treaties, collectively known as the Stevens Treaties, do not constitute a grant from the federal government, but are a reservation of rights not ceded by the tribes when they ceded their lands to the United States (WDFW 1997a; Condello 1996).

Tribes have subsistence and fisheries rights on reservation lands and off reservation within defined "usual and accustomed areas" (U and As). U and As for the numerous Treaty Tribes overlap and, collectively, cover all of Puget Sound and adjacent marine waters. Treaty Tribes set and enforce fisheries regulations (gear types, harvest restrictions, openings, and closures) for tribal fishers.

As co-managers of the state's fishery resources, the Treaty Tribes and the state work to carry out fishery management activities and abide by regulations or closures based upon joint harvest management agreements and harvest management plans (Bradbury, personal communication 1997c). The fisheries management authority of the state is limited with respect to reserved Treaty Tribes rights. With a possible exception for conservation purposes, the state may not regulate Treaty Tribes fishing.

MPAs and the Treaty Tribes

Because U and As essentially cover all of Puget Sound, each of the MPAs discussed in this report is located within a reserved fishing area of one or more Treaty Tribes[12]. This has important implications for the management of these existing sites. When the state considers the establishment of a new MPA, or when management policy changes are proposed for existing sites, especially where there is potential for impact to fishing, shellfishing or resource access, government-to-government level interaction with the appropriate Treaty Tribes must take place.

Some Treaty Tribes have recognized the state's marine preserves in the past (Toba, personal communication 1997). Where MPAs restrict the take of or access to fish or shellfish resources, some tribes have negotiated special site-specific arrangements or agreements with the state (Kirby, personal communication 1997a). These agreements, which may be contained within cooperative management plans for certain fisheries, specify agreed-upon closed areas. Tribes do, however, reserve their rights to future activities in any specific area within their U and As (Kirby, personal communication 1997b). It is beyond the scope of this report to identify and attempt to explain all such agreements in place which apply to existing MPAs.

Recently, the tribes and the Washington Department of Fish and Wildlife (WDFW) have been jointly evaluating closed shellfish areas established by the state (Bradbury 1996; personal communication 1997a). Negotiations between the tribes and WDFW resulted in the re-opening to commercial harvest of two small sites (at Gull Reef and Green Point in the San Juan Islands) which had been previously closed for sea urchin and sea cucumbers (Bradbury, personal communication 1997b). The state and Treaty Tribes are continuing to evaluate these and other closed shellfish areas, including areas recognized as MPAs in this study, and additional state regulatory changes may result (Bradbury, personal communication 1997b).

Overall, the Washington coastal Treaty Tribes play an integral role with regard to MPA planning, establishment and management. As the region considers additional MPA development, close coordination with the tribes will be requisite and essential.

4.4 Local Government

The role of local government in Puget Sound MPA establishment and management is significant and understudied. Twelve counties and numerous cities own and manage more than 150 public park areas (Scott et al. 1986) along the shores and tidelands of Puget Sound. Other areas under city or county management that may contain intertidal or subtidal components include recreation areas, public beaches, public access points, boat launches, landings, marinas, marine laboratories or educational institutions, and other shoreline open space. In addition to the ownership, establishment and management of these sites, local governments often possess detailed knowledge of natural resources and resource use patterns, and operate with a close and important connection to local citizens and communities. The stewardship and conservation interests and actions of local governments have been vital to the establishment of several existing MPAs. Furthermore, land use planning and development carried out at the local government level plays a crucial role in shoreline and marine habitat protection.

This section discusses the role of cities and counties in MPA establishment and management primarily through highlighting sites of local government designation. Of those identified in this study, these sites include the Edmonds Underwater Park, Titlow Beach Marine Preserve, Tongue Point Marine Life Sanctuary, and the San Juan County Voluntary No-Take Bottomfish Recovery Areas. However, as mentioned at Section 3.3 regarding the limits of this study's identification of MPAs, not all city- and county- established parks and similar areas were able to be fully investigated. As such, the local government sites represented in this study provide a representative, but not necessarily comprehensive, list of MPAs.

This section will also touch briefly on the role of local governments in developing Shoreline Master Plans under the state's Shoreline Management Act as well as similar responsibilities under the state's Growth Management Act.

4.4.1 Local Government-established MPAs Identified in this Study

This study has already mentioned two MPAs (Edmonds Underwater park and Titlow Beach Marine Preserve) that were established at the city government level (see Section 4.1.2). An additional two sites identified in this study, Clallam County's Tongue Point Marine Life Sanctuary and San Juan County's Voluntary No-Take Bottom Fish Recovery Areas, are also of local government origin. These local jurisdictions are reviewed here with respect to their involvement at these existing MPAs.

City of Edmonds

Among local jurisdictions, the City of Edmonds is a leader in subtidal marine protected area development. The county established Puget Sound's first and longest-standing complete no-take MPA, and has a policy of managing all city-owned beaches as "sanctuaries" (City of Edmonds n.d.; Ohlde, personal communication 1997).

Edmonds Underwater Park

The City of Edmonds established the predominantly subtidal 27 acre Edmonds Underwater Park in 1970. In a move unique among local jurisdictions throughout the region, the City enacted ordinances that specifically prohibit the taking of *any* marine life (plant or animal, whether WDFW-classified or not) from underwater parks (City of Edmonds Ordinance 5.32.070). This no-take MPA site was established and is managed to provide a

high quality and safe recreational site for scuba diving (Higgins, personal communication 1996), and as such has been classified in this study as a Recreational Marine Preserve[13]. The City's Park Regulations code also states that the site is reserved to "provide the public, scientists and students the opportunity to examine over a period of time the ecological relationships within such area" (City of Edmonds, Ordinance 5.32.005A).

Through this local regulation, and through the successful stewardship of the site, the Edmonds Underwater Park has been closed to all fishing pressure for 27 years (1970-1997). As previously mentioned, recent studies have shown that at this long term no-take MPA, fish density, size and reproductive output are dramatically greater for surveyed bottomfish species by comparison to fished sites (Palsson and Pacunski 1995).

Scuba divers and other volunteers are closely involved in planning and management for the site. The City of Edmonds provides partial financial support to a volunteer group informally referred to as the Underwater Park Stewards, who maintain and enhance the site on a weekly basis (Higgins, personal communication 1996).

The Edmonds Parks and Recreation Department administers a Beach Ranger Program that provides a community environmental educational service on city beaches. The staff and volunteer Beach Rangers patrol the beach in the spring and summer months, interpreting marine ecology, teaching the importance of protecting the marine environment, and explaining park regulations for visitors (City of Edmonds n.d.; Lider, personal communication 1997). If necessary, City of Edmonds Police officers will be called on to enforce park regulations (Lider, personal communication 1996).

City of Tacoma

The City of Tacoma, through the work of the Metropolitan Parks District, has played a key role in the establishment of a Puget Sound MPA, the Titlow Beach Marine Preserve, which exemplifies marine protected area development through an integrated planning approach.

Titlow Beach Marine Preserve

Established in 1994, the approximately 56 acre (Higgins, personal communication 1997) Titlow Beach Marine Preserve was developed through involvement of and coordination among private individuals, local schools, scuba diving organizations, the Metropolitan Parks District of Tacoma (METRO) and the Washington Department of Fish and Wildlife (WDFW). The site brings together public involvement in stewardship and planning; student involvement in habitat enhancement, educational and research activities; METRO management, supervision, enforcement and educational services; and WDFW legal protection to foodfish and shellfish resources. Early interest in creating a marine preserve at Titlow Beach came from science teachers at the nearby Bellarmine Preparatory high school who wanted an area where students could study an undisturbed marine environment. Scuba diving groups were also interested in the establishment of the site as a preserve. A Titlow Park Advisory Committee was formed, with representation from Bellarmine Preparatory high school, Washington Scuba Alliance, the Nature Center at Snake Lake, the Washington Department of Fisheries, and city planning and parks staff (Larson 1993). Presented with a proposal, WDFW then considered harvest closures for the site and took the proposal through a consultation and public review process. In March of 1994, WDFW enacted harvest closure regulations prohibiting all take of shellfish (WAC 220-56-307) and food fish, except for salmon fishing with artificial lures from shore or a non-motorized vessel (WAC 220-56-128). At the same time, seaweed harvest was prohibited under a local ordinance (City of Tacoma Ordinance No. 24663, 8.27.100).

There is a Master Plan for Titlow Beach, and the marine preserve and marine education is a key planning and management component (METRO 1993). METRO also administers a volunteer-based Beach Watch program, provides multi-lingual educational brochures and videos about the Preserve, and has plans for the development

of an on-site interpretive center and the placement of perimeter buoys (May, n.d; METRO 1993; Weathers, personal communication 1997a).

Clallam County

Tongue Point Marine Life Sanctuary

Along the Strait of Juan de Fuca, the rocky intertidal shoreline of Tongue Point is popular area with visitors to Salt Creek County Park. In response to increasing problems and concerns with collection of marine resources, particularly intertidal organisms, the Board of Clallam County Commissioners passed in 1989 park regulations specific to this site that prohibit the removal of driftwood or any form of marine life (C.C.C. 23.03.140(5)(a)), thus creating the Tongue Point Marine Life Sanctuary. The intent is to keep pedestrian visitors from harming or removing the site's intertidal marine life, and the objective is to ensure future visitors can enjoy observation of these resources (Jacobs, personal communication 1997a).

Unlike the other local government-established sites already mentioned (Edmonds Underwater Park and Titlow Beach Marine Preserve), the Tongue Point Marine Life Sanctuary is not legally backed by site-specific state fishery harvest closures. The "marine life" the County is protecting excludes clams, crabs and mussels gathered within WDFW-set seasons and limits, and the ordinance also does not apply to sport fishing (C.C.C. 23.03.140(5)(a)). However, a 1989 interagency agreement with DNR does allow for Clallam County to manage (control public use of) the public tidelands and bedlands along the site's approximately 1 mile of rocky intertidal shore (DNR 1989a).

A Salt Creek County Park deputized officer is on site year round, and watches closely for violations (Jacobs, personal communication 1997b). The County does not enforce regulations on or under the water; the Park officer concentrates on shore-based activities which can be observed as part of routine land-based patrols, and over which the proper authority exists for enforcement (Jacobs, personal communication 1997b). Interpretive signs describing marine life and habitat, and informing visitors of Sanctuary regulations, are posted at trailheads.

San Juan County

In recent years, San Juan County has taken very seriously the threats to marine resources in its jurisdiction, and has developed unique and innovative responses to address such problems.

The Marine Resources Committee and the Bottom Fish Recovery Program

In March of 1996, the San Juan County Board of Commissioners, responding to public concerns, identified a series of marine resource related problems, and appointed a Marine Resources Committee (MRC) to look into possible solutions. MRC members represent scientists, politicians, fishers, business owners, and the public at large (San Juan County MRC 1997a). In response to the specific problem of declines in bottom fish and fishing conditions, the MRC adopted as one of its missions the proposal and development of an "approach to restore and conserve bottom fish" (San Juan County MRC 1996), and from this a Bottom Fish Recovery Program was established.

Voluntary No-Take Bottom Fish Recovery Areas

The MRC spent about one year (1996-97) devising a program modeled on the successes of other MPAs such as Edmonds Underwater Park (previously mentioned) and the Friday Harbor-to-Point Caution San Juan Island Marine Preserve (see Section 4.1.5) (San Juan County MRC 1997a). The MRC consulted with scientists,

resource managers, government specialists, long-time local fishers, and held a series of public meetings, all of which resulted in the identification of eight proposed sites (San Juan County MRC 1997a). In June of 1997, the Board of County Commissioners passed a resolution designating eight sites as "bottom fish recovery voluntary-only no-take areas" (San Juan County BOCC 1997).

The sites are fairly small, individually ranging from 27 to 136 acres in size and collectively comprising approximately 527 acres. The seaward boundary for all eight sites is set at 1/4 mile from shore (Rogers-Bennett, personal communication 1997). Salmon fishing is not discouraged at these MPAs (Rogers-Bennett, personal communication 1997).

A unique aspect of these new county-established MPAs is that their "no-take" status (for bottom fish) is voluntary only, to be supported through education and monitoring efforts coordinated by the MRC and partners. The sites are not backed by any formal rules, legal restrictions or laws set in place to control fishing activity. While voluntary MPAs have not yet been attempted in this region, several years of experience with this approach can be found in the Philippines and the UK (Gubbay and Welton 1995).

Although these recently-established MPAs are just developing, work in progress and plans include: hiring of a manager for the Bottom Fish Recovery Program; posting of shore-based signs; arranging for on-water supervision and citizen monitoring; completion of baseline video-acoustic bottom fish surveys (begun in 1997 by WDFW) at MPA and harvested control sites; production and distribution of an informational brochure; and development and distribution of additional educational materials (Kaill, personal communication 1997; Rogers-Bennett, personal communication 1997).

Other Local Jurisdictions and MPAs

It is important to note again that the above review of county- and city- established protected areas are not necessarily inclusive of all such locally-governed sites which might be considered as MPAs. In particular, parks in the City of Seattle (Discovery Park and others) and the City of Des Moines are not represented here, but have in place policies and rules that restrict collection of intertidal marine life on city beaches (WDFW, unpublished, 1997a). Further investigation of these and other jurisdictions and sites is required to form a more comprehensive view of local government MPAs.

City or county-established marine laboratories are another possible source of MPAs. Laboratories with private intertidal holdings may protect by these areas from human intrusion or marine biota collection. As mentioned at Section 3.3, this study was not able to investigate the potential MPA role of all marine laboratories and other institutions or organizations holding title to private tidelands in Puget Sound.

4.4.1 Local Land Use Planning and MPAs

Shoreline Management Act

The role of local governments in developing Shoreline Master Programs pursuant to the state's Shoreline Management Act was previously discussed at Section 4.1.4 on the Washington Department of Ecology (Ecology). As discussed in that section, the requirements for development of Shoreline Master Programs provide for environment classification designations (including "natural" areas), and special planning guidelines for "shorelines of statewide significance." While the SMA is not directly responsible for the designation of marine protected areas identified in this study, its role as a planning and permitting tool and in providing support for or establishment of MPAs is explored briefly. Refer to Section 4.1.4 for this discussion.

Growth Management Act

The state's Growth Management Act (GMA), passed in 1990, attempts to address the problem of uncoordinated and unplanned growth. With respect to marine protected areas, an unexplored aspect of the GMA involves its potential role in creating or supporting the establishment of MPAs. While none of the MPAs identified in this study are credited with establishment based in GMA planning alone, the potential MPA role of this Act is discussed briefly here.

The GMA provides planning goals to guide local governments in the development and adoption of comprehensive plans and development regulations. The GMA directs cities and counties to designate and pass development regulations to protect "critical areas," which by definition include wetlands and fish and wildlife habitat conservation areas, as well as other non-marine areas (Washington Dept. of Ecology 1994). The Washington State Department of Community, Trade, and Economic Development (DCTED) sets minimum guidelines and procedural criteria that local governments use to prepare various GMA planning products (Washington Dept. of Ecology 1994).

Of the eight types of areas that DCTED guidelines define under the critical area referred to as "fish and wildlife habitat conservation areas," six pertain or may pertain to marine environments (WAC 365-190-080-080(5)(a)). These include all but items (v) and (vii) listed below:

(i) Areas with which endangered, threatened, and sensitive species have a primary association;
(ii) Habitats and species of local importance;
(iii) Commercial and recreational shellfish areas;
(iv) Kelp and eelgrass beds; herring and smelt spawning areas;
(v) Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat;
(vi) Waters of the state;
(vii) Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; or
(viii) State natural area preserves and natural resource conservation areas.

DCTED guidelines also provide that counties and cities, in consideration of classifying and designating critical areas, may consider the following (WAC 365-190-080-080(5)(b)):

(i) Creating a system of fish and wildlife habitat with connections between larger habitat blocks and open spaces;
(ii) Level of human activity in such areas including presence of roads and level of recreation type (passive or active recreation may be appropriate for certain areas and habitats);
(iii) Protecting riparian ecosystems;
(iv) Evaluating land uses surrounding ponds and fish and wildlife habitat areas that may negatively impact these areas;
(v) Establishing buffer zones around these areas to separate incompatible uses from the habitat areas; and
(vi) Restoring of lost salmonid habitat.

These elements provide a framework within which designated critical areas in the marine environment might be incorporated into local plans to, for example, "create a system" of protected habitats or possibly establish protective "buffer areas" around certain marine critical areas. As such, while these GMA elements are not representative of a protected areas program per se, and though they do not provide local governments with additional regulatory authority to establish protected areas, the DCTED criteria and guidelines do encourage proactive local planning that appears consistent with and supportive of the establishment of marine protected areas (Condello, unpublished, 1996).

4.5 Private Sector/Non Governmental Organizations

Citizens, landowners, non-governmental organizations and other private sector groups play a vital role in protecting and preserving marine areas and their values throughout Puget Sound. Acting independently, in groups or coalitions, or in partnership with various levels of government, private sector efforts can help secure, preserve, restore and manage protected areas in the marine environment. In cases where government agencies are limited by shrinking budgets and shifting priorities, land trusts and other private sector efforts can be more effective at acquiring lands (including intertidal) and providing consistent management attention and site stewardship. Private sector entities also raise public, political and governmental awareness of the marine environment and MPAs, efforts which can shape related policies and bring about or halt actions.

This summary review does not attempt to comprehensively identify and discuss the long list of private sector entities that might have an interest, involvement or stake in MPA establishment. As MPAs affect and attract the attention of so many groups, such a list of stakeholders would indeed be long, and include individuals, commercial and recreational fishing groups and associations, scuba diving and other organized recreational groups, conservation organizations, academic and educational institutions, land trusts, and a variety of additional citizen groups and collaborative efforts.

This section will limit private sector review primarily to a brief discussion of organizations that are directly responsible for establishing intertidal MPAs in Puget Sound, and the organizations' designation mechanisms. Following a brief discussion on private ownership and protection of tidelands, the role of land trusts and The Nature Conservancy of Washington, which have established some of the MPA sites identified in this study, are highlighted.

4.5.1 Privately Owned Tidelands and MPAs

Although the practice was discontinued in the early 1970s, approximately 61% of the state's tidelands have been sold to private interests (DNR 1992). Because it is possible to own tidelands, an opportunity is provided for the private sector to become directly involved in establishing and managing protected intertidal areas. However, in considering how a citizen, non-governmental organization, or other group could independently establish a marine protected area, it is important to note that the approach available is essentially limited to proprietary-based protection of private tidelands. For example, the establishment of regulatory-based MPAs, such as no-take reserves or other areas closed to fishery harvest, require actions and agreements from state government agencies and Treaty Tribes. Furthermore, bedlands (subtidal areas) are held by the state in public trust and cannot be privately owned, and as such may not be privately designated as an MPA.

Exercising private property rights to restrict public access to or use of tidelands, including for purposes of marine conservation, is a controversial and complex matter. The Public Trust Doctrine, an old judicial doctrine that has become part of Washington law, provides protection of public ownership interests in certain uses of navigable waters and underlying lands, including navigation, commerce, fisheries, recreation and environmental quality (Johnson et al. 1991). Even though tidelands may be privately owned in Washington, the public trust doctrine holds that a public property interest, the jus publicum, remains with these lands and the waters flowing over them (Johnson et al. 1991). Thus, while a landowner might post "no trespassing" signs on a private beach, or while a non-governmental organization may establish a "no access" preserve area encompassing privately owned tidelands, these actions, depending on if and how they are carried out, appear to run counter to the public trust doctrine. Ultimately, public trust doctrine issues and potential conflicts are for the courts to resolve. While noted as an important element in consideration of private sector MPAs, this legal doctrine and associated issues are not discussed further here[14].

Registering a Natural Area with DNR

Previously mentioned at Section 4.1.1 on the Washington Department of Natural Resources, the state's Natural Heritage Program provides a mechanism for private landowners to voluntarily register lands as Natural Areas. The lands must first be recognized, through the Natural Heritage Program, as being important for the preservation of the state's natural heritage resources. Then, with the landowner's wholly voluntary permission, the site may be registered. The landowner agrees to voluntarily protect the site, or may make other management arrangements with DNR (DNR 1995).

As of 1995, over 90 private, local and federal landowners have voluntarily agreed to protect natural resource values on their property through registration as a Natural Area (DNR 1995). However, statistics are not available on the extent of privately owned tidelands represented within this system, and privately owned site locations are not advertised. Refer to Section 4.1.1 for more information about the Natural Heritage Program.

4.5.2 Land Trusts

Land trusts are usually locally-based non-profit organizations directly involved in protecting important land resources for the public benefit (Rubey and O'Conner 1996). Land trusts represent a variety of organizations, and are also known by names such as conservancies, foundations and associations. Although they are often run by volunteers and depend on financial support, land trusts are notably effective in quickly acting to protect lands (LaTourrette 1997).

Working to protect natural, recreational, scenic, historic, cultural, scientific, educational or other open space values, land trust organizations may directly own lands (acquired by purchase or gift), or they may sign conservation easements with willing landowners. Landowners that convey some or all of their interest in land to a land trust are often eligible for income tax deductions or lowered property and estate taxes (Rubey and O'Conner 1996). A conservation easement, as a legal agreement, combines the traditional right to private ownership of land with the modern refinement of restricting development rights attached to that land as an act of voluntary land conservation (Pritchard 1997). Land trusts often take on the responsibilities of surveying lands for their highest conservation values, overseeing the easement agreement process, providing land stewardship and management, and enforcing land restrictions (Johns 1996; Rubey and O'Conner 1996).

Land Trusts Operating Near Puget Sound

Rubey and O'Conner (1996) provide a comprehensive listing of national, regional and local land trusts operating in Washington State, identifying 40 organizations and profiling the types of lands held or sought. Of these organizations, eighteen or more local land trusts operate in Puget Sound counties and have been reported as holding, or placing a priority on, land types described as "shorelines," "coastlines," or supporting other features which might be found in intertidal areas (see **Table 17**).

Land Trusts and MPAs

With so many land trusts working to preserve open spaces such as shorelines, coastlines, islands, wetlands, scenic views, ecosystems and wildlife habitat (see **Table 17**), and considering that 60% of the state's tidelands are privately owned, significant opportunity is provided for these organizations to establish Puget Sound intertidal MPAs.

In this study, with the exception of seven preserve sites owned by the Nature Conservancy and one preserve sight owned by the San Juan Preservation Trust, additional land trust holdings and conservation easements encompassing intertidal areas are not identified. As previously mentioned at Section 3.3, pursuit of this data,

which would require extensive additional research, was excluded from the scope of this study. However, serving as highlights and examples of the role land trust organizations can play in MPA establishment and management, the Nature Conservancy and the San Juan Preservation Trust are reviewed briefly next.

4.5.3 The Nature Conservancy

The Nature Conservancy (TNC) is a private, non-profit conservation organization committed to preserving plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Founded in 1951, The Nature Conservancy owns and manages 1600 nature preserves nationwide (TNC 1997a).
The Nature Conservancy of Washington was founded in 1960, and has focused its resources on protecting native species and habitats. The organization's goal is to "protect the state's biological diversity by acquiring the best examples of its natural ecosystems" (TNC 1997a). TNC has a broad membership base and is assisted by many volunteers. For example, in 1994, TNC of Washington had 66 corporate members, 300 volunteers, and statewide membership was at 29,000 households (TNC 1996a). TNC has established 30 preserves and completed 155 cooperative projects in Washington (TNC 1997b).

The Nature Conservancy of Washington uses a market-based approach to preserving the state's critical habitats, working closely with government agencies, corporations and land owners. Its conservation strategy is threefold: identification, acquisition and management (TNC 1997a).

In addition to buying outstanding natural areas for preservation, TNC also works with a wide range of individual and agency partners to assist in acquisition and cooperative management of significant lands (Rubey and O'Conner 1996). TNC has assisted public agencies and programs, such as the Washington Natural Heritage Program, by conducting extensive field work to identify imperiled natural resources, acting quickly to acquire special lands, and transferring properties to agencies when program funds become available for purchase. For example, TNC acquired and held lands at Protection Island and near Dabob Bay (two sites identified in this study as intertidal MPAs) that were later acquired and protected by the U.S. Fish and Wildlife Service and DNR, respectively (TNC 1996a; USFWS 1985).

Table 17. Land Trust Organizations Operating in Washington State and Puget Sound Counties[1]

Name	Area of Operation	Main land types emphasized of a marine or potentially marine nature
Bainbridge Island Land Trust	Bainbridge Island	coastlines, ecosystems, scenic views, wetlands, wildlife habitat
Capitol Land Trust	Thurston County	coastlines, wildlife habitat
Hood Canal Land Trust	Mason and Pierce Counties	wetlands, wildlife habitat
Indianola Land Trust	Indianola	coastlines, ecosystems, recreation, wetlands, wildlife habitat
Jefferson Land Trust	East Jefferson county	coastlines, ecosystems, wetlands, wildlife habitat
Kitsap Land Trust	Kitsap County	open space, scenic views, wetlands
Land Conservancy of Seattle and King County	Seattle-King County region	coastlines, ecosystems, scenic views, wetlands, wildlife habitat
Nisqually River Basin Land Trust	Nisqually River basin	coastlines, wetlands, wildlife habitat
North Olympic Land Trust	North Olympic peninsula	coastlines, wetlands, wildlife habitat
Peninsula Heritage Land Trust	Pierce County	coastlines, ecosystems, recreation, scenic views, wetlands, wildlife habitat
San Juan Preservation Trust	San Juan and Skagit Counties	ecosystems, historic/cultural, islands, scenic views, wetlands, wildlife habitat
Skagit Land Trust	Skagit County	open space, islands, scenic views, wetlands, wildlife habitats
Snohomish County Land Conservancy	Snohomish County	coastlines, wetlands, wildlife habitat
Tahoma Land Conservancy	Pierce County	ecosystems, scenic views, wetlands, wildlife habitats
The Nature Conservancy of Washington	Statewide	
Vashon Maury Island Land Trust	Vashon-Maury Island	coastlines, ecosystems, wetlands, wildlife habitat
Whatcom County Land Trust	Whatcom County	coastlines, ecosystems, recreation, scenic views, wetlands, wildlife habitat
Whidbey-Camano Land Trust	Island County	archaeological sites, coastlines, historic/cultural, islands, scenic views

1. Not intended as a comprehensive listing. The organizations listed here are those described by the Washington Department of Ecology (Rubey and O'Conner 1996) (see below) as operating within Puget Sound counties and/or statewide, and with stated purposes or main protected land types including "shorelines," "coastlines," or other potentially marine intertidal environments. For a more complete listing of land trusts, consult the Washington Department of Ecology (see reference below).

Data from: Rubey, J. and S. O'Conner. 1996. Exploring wetlands stewardship: A reference guide for assisting Washington landowners. Washington Department of Ecology, Olympia, WA.

TNC San Juan Preserve System and MPAs

The Nature Conservancy began work in the San Juan Islands in the mid-1970s. A county-wide survey to locate the best remaining natural areas drove a fundraising effort that developed into an acquisition program known as the "Islands of Life Campaign" (Johns 1996). This eventually enabled TNC to purchase seven sites in the islands. These sites, plus an additional site held under conservation easement, comprise TNC's San Juan Preserve System.

TNC Preserve Purposes and Goals

Nature Conservancy Preserves are established to protect high quality examples of typical or unique natural features in Washington State, with primary emphasis given to rare plant or animal communities. The Preserves are dedicated to scientific study, education and the observation of nature (Gordon 1993). Management goals specific to TNC's San Juan Preserve System are: 1) to preserve, protect, and maintain natural communities, native plants, and wildlife with emphasis on threatened and endangered species; 2) to encourage scientific research on preserves; and 3) to promote environmental education (Johns 1993).

TNC Preserves as MPAs

Of the 30 TNC preserves in Washington, seven Puget Sound sites are identified in this study as functioning as intertidal MPAs (**Table 18**). These sites represent TNC-owned preserves that either encompass privately owned tidelands or are have had fronting public tidelands withdrawn from conflicting uses by DNR (see Section 4.1.1 for a description of DNR's involvement in the withdrawal of public aquatic lands). Not included in the listing presented at Table 18 are additional holdings at Waldron Head (where tideland status could not be definitively confirmed), and the conservation easement parcel mentioned above.

Natural Heritage Program Designation Assessments for TNC Preserves

As previously mentioned at Section 4.1.1 on the Washington Department of Natural Resources, the state's 1995 Natural Heritage Plan identifies and assesses the security and protection adequacy of several land management designations found in Washington. The Nature Conservancy Preserves, as registered Natural Area Preserves (NAPs), are noted as providing the same level of protection to natural heritage elements as provided at NAPs of DNR ownership.

According to this assessment system, the "designation security" of TNC Preserves is ranked as "secure," meaning that the management designation cannot be readily changed or removed (DNR 1995, B-3). This system also assessed "protection adequacy" for designation types, which is a measure of the ability of a designation type to assure survival into the foreseeable future of various elements identified by the Natural Heritage Program as needing representation within the Natural Areas System. Protection adequacy for TNC Preserves are ranked as "adequate," meaning Natural Heritage Program elements on site will typically be assured survival into the foreseeable future (DNR 1995). Using these criteria, the rankings assigned by the Natural Heritage Program for TNC preserves are the highest possible.

Table 18. Puget Sound Preserves Owned and Managed by The Nature Conservancy, Identified in this Study as Intertidal MPAs

Preserve Name/location	*MPA Category*[1]	*Year of Establishment*	*Open to public (yes/no)*
Yellow Island Preserve	Marine Habitat/Nature Preserve	1980	yes
Chuckanut Island / Cyrus Gates Memorial Preserve	Marine Habitat/Nature Preserve	1976	yes
Foulweather Bluff Preserve	Marine Habitat/Nature Preserve	1966	yes
Goose Island Preserve	Marine Habitat/Nature Preserve	1975	no
Deadman Island Preserve	Marine Habitat/Nature Preserve	1975	no
Sentinel Island Preserve	Marine Habitat/Nature Preserve	1979	no
Waldron Island Preserve	Marine Habitat/Nature Preserve	1968	yes

1. MPA categories were created for this study, and do not represent institutional designations or titles. See Section 3.1.2 for a description of MPA categories.

TNC Preserve Rules and Management

Of the seven TNC preserves identified in this study as MPAs, three are closed to public access (Goose, Deadman and Sentinel Islands), while the other sites allow for limited visitation. At all Washington Nature Conservancy Preserves, the following restrictions are in effect (Gordon 1993; TNC, unpublished 1997b):

- No hunting or trapping
- No collecting plants or animals or their remains

- No camping
- No campfires
- No smoking
- No horses
- No bicycles or other off-road vehicles
- No pets (except seeing-eye dogs)

There is also a prohibition on fishing at Nature Conservancy preserves which is described by a former preserves manager as pertaining to those visitors that might attempt to fish while on Preserve property (Johns, personal communication 1997; Krause, personal communication 1997; Pritchard, personal communication 1997).

Supervision and on-site management are handled by a number resources. For example, a TNC preserve manager resides at Yellow Island and also oversees management of Sentinel Island Preserve; volunteer stewards periodically visit preserves at Chuckanut Island and Foulweather Bluff; an on-site caretaker oversees the TNC preserve at Waldron Island; and researchers at the University of Washington's Friday Harbor Laboratories assist in supervision at Goose and Deadman Island preserves (Johns, personal communication 1997; Krause, personal communication 1997; Pritchard, personal communication 1997; Scruton, personal communication 1997).

4.5.4 The San Juan Preservation Trust

The San Juan Preservation Trust, a private, non-profit, tax -exempt corporation, provides a good example of the kind of role that land trusts operating in the region (see Table 17) can play in preserving open spaces, including intertidal land areas.

By the mid 1980s, high real estate prices and priorities in other parts of the state brought to a close a land acquisition phase in the San Juans by The Nature Conservancy. Concerned about increasing development pressures and with knowledge of important sites that remained unprotected, local members that had been involved with TNC's efforts built on the momentum and success of TNC's "Islands of Life" program (previously mentioned) and formed The San Juan Preservation Trust (Johns 1997).

Established in 1979, The San Juan Preservation Trust works with landowners who wish to voluntarily place conservation protection on their land (Johns 1997). The organization is dedicated to preserving scenic open spaces, forests, agricultural lands, habitats, vital wetlands, and shorelines in the San Juan Islands (SJPT 1997). Lands held in fee and designated as "preserves" by the Trust are managed to protect the habitat of native floral and faunal communities (Johns, personal communication 1997b).

As of January 1, 1997, the San Juan Preservation Trust held 104 conservation easements, owned 19 parcels in fee, and managed 6,787 total acres under trust programs (SJPT 1997). These lands include 13.5 miles of shoreline. However, the extent of these shoreline areas which include privately owned tidelands is a statistic which is not readily available (Johns, personal communication 1997).

Kimball Preserve, Decatur Island

One example of a preserve area established on uplands and tidelands owned by the San Juan Preservation Trust is the Kimball Preserve on Decatur Island. Located at the southwest tip of Decatur Island in the San Juan archipelago, the Preserve contains 8700 waterfront feet, and a significant (but unmeasured) portion of this encompasses adjacent tidelands (Johns, personal communication 1997b). An identified intertidal MPA, the Kimball Preserve has been classified in this study as a Marine Habitat/Nature Preserve[15].

In addition to upland features such as grass headlands and forest community, the Preserve's diverse marine shoreline and an uncommon tombolo land-form represent features extending into intertidal zone that are a priority for protection (Johns, personal communication 1997b).

Access to the site is allowed only with the written permission of the San Juan Preservation Trust. A management plan has been written for the site, and a volunteer is assigned to visit the site at regular intervals throughout the recreation season.

[1] Because of this limited representation, and because the evaluation of "protection adequacy" used is specific to Natural Heritage Program goals and objectives, this study makes only limited reference to the Natural Heritage Plan's assessment of various protected area designation types, and does not draw on that source for system-wide MPA analysis.

[2] The multiple use protected area category created for use in this study is not defined in the same way that the "multiple use management" concept is defined by the National Forest Service. See Section 3.1.2 for an explanation of the categories used in this study.

[3] Prior to 1994, WDFW responsibilities were divided between the separate agencies of the Washington Department of Fisheries and the Washington Department of Wildlife. The separate agencies have since merged, and recodification work is underway to consolidate their respective laws (RCW Title 77 for Fisheries and RCW Title 75 for Wildlife).

[4] As of late 1997, a WDFW proposal was under consideration that would expand the size of the state-closed area at Edmonds Underwater Park to match the City's park boundary.

[5] Refer to Section 4.1.1 (Washington Department of Natural Resources) for a discussion on Natural Area Preserves.

[6] The protected area term "Natural Area", as noted with reference to the original designation of the Zella M. Schultz Seabird Sanctuary, appears not to be in use at WDFW. Although it does not appear to be a reference to Natural Area Preserve (see Section 4.1.1 on DNR), it's current protected area equivalent type (if it exists) is unknown.

[7] Under administrative law, "fish" are defined by WSP&RC as "...all marine and freshwater fish and shellfish species including all species of aquatic invertebrates" (WAC 352-32-150(1)).

[8] The MPA Categories referred to in this study are defined and discussed in Section 3.1.2.

[9] The MPA Categories referred to in this study are defined and discussed in Section 3.1.2.

[10] Graveyard Spit was set aside by USFWS as a Research Natural Area (RNA) in 1990 due to its unique vegetative characteristics. USFWS defines RNA's as "areas where natural processes are allowed to predominate without human intervention." Activities on RNA's are limited to "research, study, observation, monitoring, and educational activities that are non-destructive, non-manipulative, and maintain unmodified conditions" (USFWS 1997b).

[11] As defined by the National Park Service, a National Natural Landmark is a nationally significant natural area, designated by the Secretary of the Interior, representing one of the best examples of a type of biotic community or geologic feature in its physiographic province. The National Natural Landmarks Program is not a land taking or withdrawal program; it does not change the ownership of a site and does not dictate activity. The National Natural Landmark Program recognizes and encourages the voluntary, long-term commitment of public and private owners to protect an area's outstanding values. The Nisqually Delta National Natural Landmark is recognized as supporting one of the five best known examples of the Washington-Oregon Salt Marsh Subtheme in the North Pacific Border Region, and as a major resting area for migratory waterfowl in the southern Puget Sound region (NPS 1997).

[12] Specific U and A areas for individual tribes are not identified in this report. U and As are established under court order, and may change over time. Consult individual tribes, applicable court decisions, or the Washington Department of Fish and Wildlife for more information on western Washington Treaty Tribe U and A locations.

[13] The marine protected area categories created for this study are presented and described at Section 3.1.2

[14] For a more thorough treatment of the public trust doctrine and its applicability in Washington state, see *The Public Trust Doctrine and Coastal Zone Management in Washington State* by Johnson et al. (1991).

[15] MPA categories were created for the purpose of this study. They do not reflect institutional designations or titles. Refer to Section 3.2 for a description of the MPA categories used in this study.